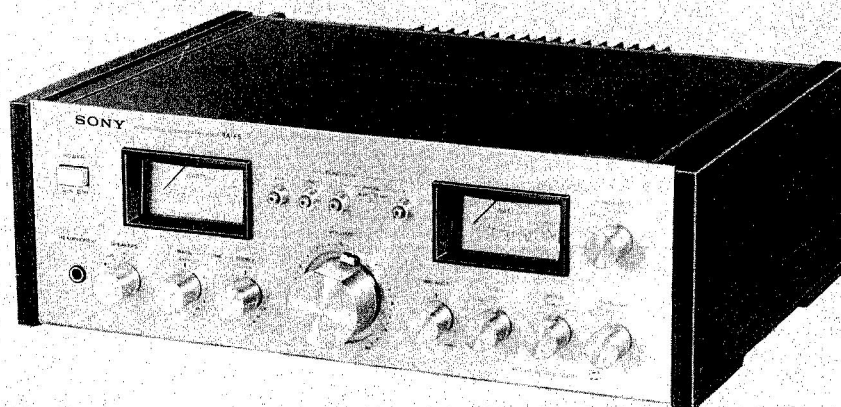


# TA-F5

Canadian Model



## INTEGRATED STEREO AMPLIFIER



### SPECIFICATIONS

#### GENERAL


**Power Requirements:** 120 V ac, 60 Hz

**Power Consumption:** 320 VA


**AC Outlets:** 2 switched 100 watts  
1 unswitched 50 watts

**Dimensions:** Approx. 435 (w) x 145 (h) 370 (d) mm  
17 $\frac{1}{8}$  (w) x 5 $\frac{3}{4}$  (h) x 14 $\frac{5}{8}$  (d) inches  
including projecting parts and controls

#### SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND  MARK ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT  
À LA SÉCURITÉ !

LES COMPOSANTS IDENTIFIÉS PAR UN TRAMÉ ET UNE MARQUE  SUR LES DIAGRAMMES SCHEMATIQUES, LES VUES EXPLOSÉES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DES SUPPLÉMENTS PUBLIÉS PAR SONY.

**Weight:** Approx. 8.2 kg, 18 lb 1 oz (net)  
Approx. 10 kg, 22 lb 1 oz  
(in shipping carton)

#### AMPLIFIER SECTION

**Harmonic Distortion:** Less than 0.04 % at rated output  
Less than 0.02 % at 10 W output

**IM Distortion:** Less than 0.01 % at rated output  
(60 Hz : 7 kHz = 4 : 1) Less than 0.008 % at 10 W output

**Frequency Response:** PHONO 1, 2 RIAA equalization curve  
±0.2 dB

TUNER }  
AUX } 3 - 70,000 Hz +0 dB  
TAPE 1 }  
TAPE 2 } -1 dB

**Damping Factor:** 40 (8  $\Omega$ , 1 kHz)

**Residual Noise:** Less than 50  $\mu$ V (8  $\Omega$ , Network A)

— Continued on next page —

# SONY

## SERVICE MANUAL

**Inputs:**

|                           |    | Sensitivity | Impedance     | Maximum Input Level<br>(0.1 % distortion) | S/N (weighting network,<br>input level) |
|---------------------------|----|-------------|---------------|---|---|
| PHONO<br>1, 2             | MC | 0.25 mV     | 100 $\Omega$  | 25 mV                                     | 70 dB (A, 0.25 mV)                      |
|                           | MM | 2.5 mV      | 50 k $\Omega$ | 250 mV                                    | 85 dB (A, 2.5 mV)                       |
| TUNER<br>AUX<br>TAPE 1, 2 |    | 150 mV      | 50 k $\Omega$ | —   | 100 dB (A, 150 mV)                      |

**Outputs:**

|              | Voltage                                    | Impedance      |
|--------------|--|----------------|
| REC OUT 1, 2 | 150 mV                                     | 4.7 k $\Omega$ |
| HEADPHONES   | Accepts low and high impedance headphones. |                |
| SPEAKERS     | Accepts speakers of 4 — 16 $\Omega$ .      |                |

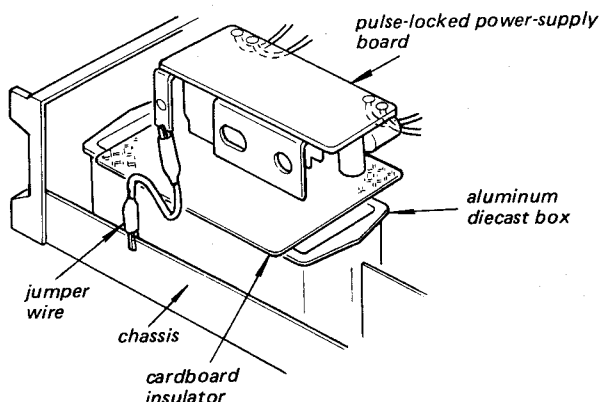
**Tone Controls:** BASS  
 $\pm 10$  dB at 60 Hz (TURNOVER FREQ 300 Hz)  
TREBLE  
 $\pm 10$  dB at 25 kHz (TURNOVER FREQ 5 kHz)

**Filters:** LOW  
6 dB/oct. below 15 Hz  
HIGH  
6 dB/oct. above 9 kHz

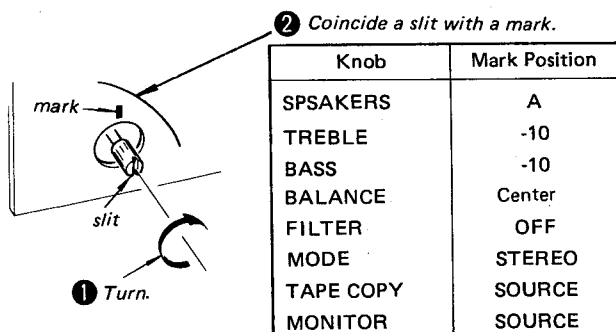
## SERVICING NOTE

1. This set has a pulse-locked power-supply circuit which is quite different from a conventional power-supply circuit. The pulse-locked power supply directly rectifies and smooths the ac input power to produce the higher dc voltages required in the power supply circuit. When servicing this set, note the following.

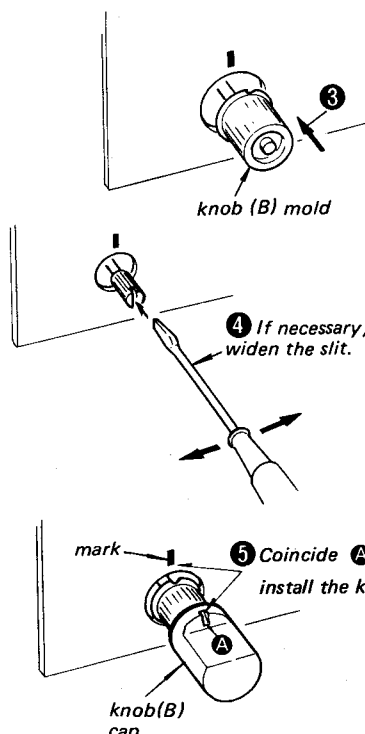
- a) To prevent unwanted radiation due to pulse signals in the pulse-locked power-supply circuit, the pulse-locked power-supply board is shielded by the aluminum diecast box.
- b) The negative circuit of the secondary rectifier in the pulse-locked power-supply circuit is grounded by screws in the aluminum diecast box. When checking the pulse-locked power-supply board out of the box, use a jumper wire and a cardboard insulator as shown on the right.



2. When replacing a knob (SPEAKERS/TREBLE/BASS / BALANCE / FILTER / MODE / TAPE COPY / MONITOR), prepare a knob (B) cap (4-854-266-00) and a knob (B) mold (4-854-267-00). Installation of the knob is as follows.



| Part No.     | Description    |
|--------------|----------------|
| X-4854-213-1 | Knob Ass'y     |
| including;   |                |
| 4-854-266-00 | Cap, knob (B)  |
| 4-854-267-00 | Mold, knob (B) |

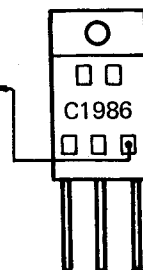


## 3. CAUTION

When replacing Q503 - Q506 in the pulse-locked power-supply circuit, use those which have the same hFE values.

Q503-506 8-729-308-62 2SC1986C-O--O

Note: O indicates the hFE value.



## SECTION 1

### OUTLINE

#### 1-1 CIRCUIT DESCRIPTION

In the power supply section of conventional audio equipment, ac input power is usually changed in voltage by a transformer and rectified to obtain a dc voltage. The disadvantages of this are as follows;

1. Voltage regulation is poor.
2. Hum in the output results if large filter are not used.
3. High-power output can not be obtained without a very large transformer.

To eliminate these problems, the pulse-locked power supply is used in this set. In the power supply, after a dc voltage is obtained by rectifying the ac input power, a 20 kHz pulse signal is generated in the inverter. The pulse signal is converted to the desired-voltage signal by a high-frequency transformer which has a small ferrite-core, and then rectified to produce dc voltages.

Fig. 1 shows the block diagram of the pulse-locked power supply. This power supply has the following advantages;

1. The source impedance can be made smaller so better voltage regulation (less than 7%) can be obtained.
2. Square waves as high in frequency as 20 kHz are used, so hum does not occur.
3. Efficiency is very high, since the dc resistance of the high-frequency transformer is small and a high-efficiency inverter is used.
4. This power supply consists of small components that result in a very small size and a light weight. This power supply is half the size and less than one quarter the weight of a conventional power supply.

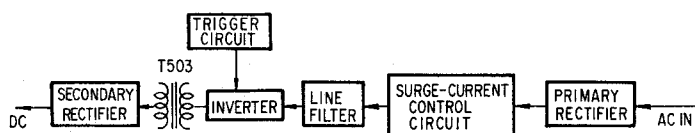


Fig. 1

#### 1. SURGE-CURRENT CONTROL CIRCUIT

(See Fig. 2)

Since the pulse-locked power supply directly rectifies ac power input, if S6 (POWER) is set to ON without a surge-current control circuit, a large surge-current charging C313 will flow and damage S6 (POWER).

To prevent this, the parallel combination of R337 to R339 are added in series with S6 (POWER) to control the rush-current. The resistors are shorted by RY302 after dc voltage appears in the secondary rectifier circuit.

#### 2. LINE FILTER (See Fig. 2)

To eliminate the high-frequency ripple component produced in the inverter, a line filter is installed. The line filter consists of C501 to C503. L501 is a bifilar RF choke having a ferrite toroidal core.

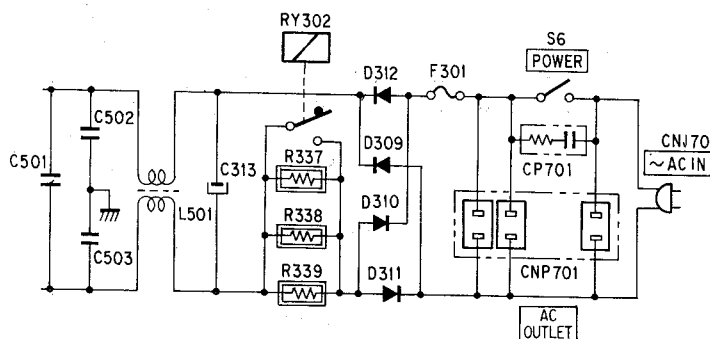


Fig. 2



### 3. INVERTER TRIGGER CIRCUIT (See Fig. 3.)

Setting S6 (POWER) to ON is not sufficient to start the inverter oscillating; a trigger signal is also required for inverter oscillation. The operation is as follows;

- 1) When S6 (POWER) is set to ON, current ① charges C506.
- 2) When the voltage between the base and emitter of Q502 becomes more than 0.6 V, Q502 and Q501 turn on.
- 3) C506 discharges and current ② flows, causing the inverter to start to oscillate.
- 4) After the start of the oscillation, the voltage appearing at the winding N2 of T503 is rectified by D501 and D502 and charges C505. As a result, Q502 and Q501 turn off so that the load on the N1 winding of T501 is reduced and the inverter operates normally, maintaining oscillation.

### 4. INVERTER CIRCUIT

The inverter consists of four transistors and generates a square-wave signal of about 20 kHz.

Fig. 4. shows the principle of the inverter. By turning S1 and S4, or S2 and S3 on and off, the square-wave signal shown in Fig. 5 is generated at the secondary side of T503. In short, dc current is changed to a square-wave signal by switching action.

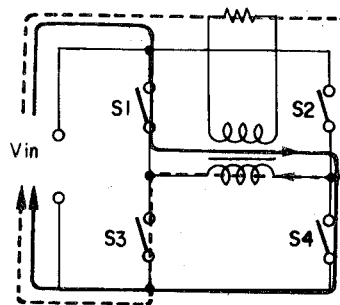


Fig. 4

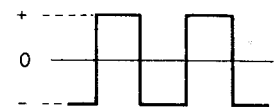
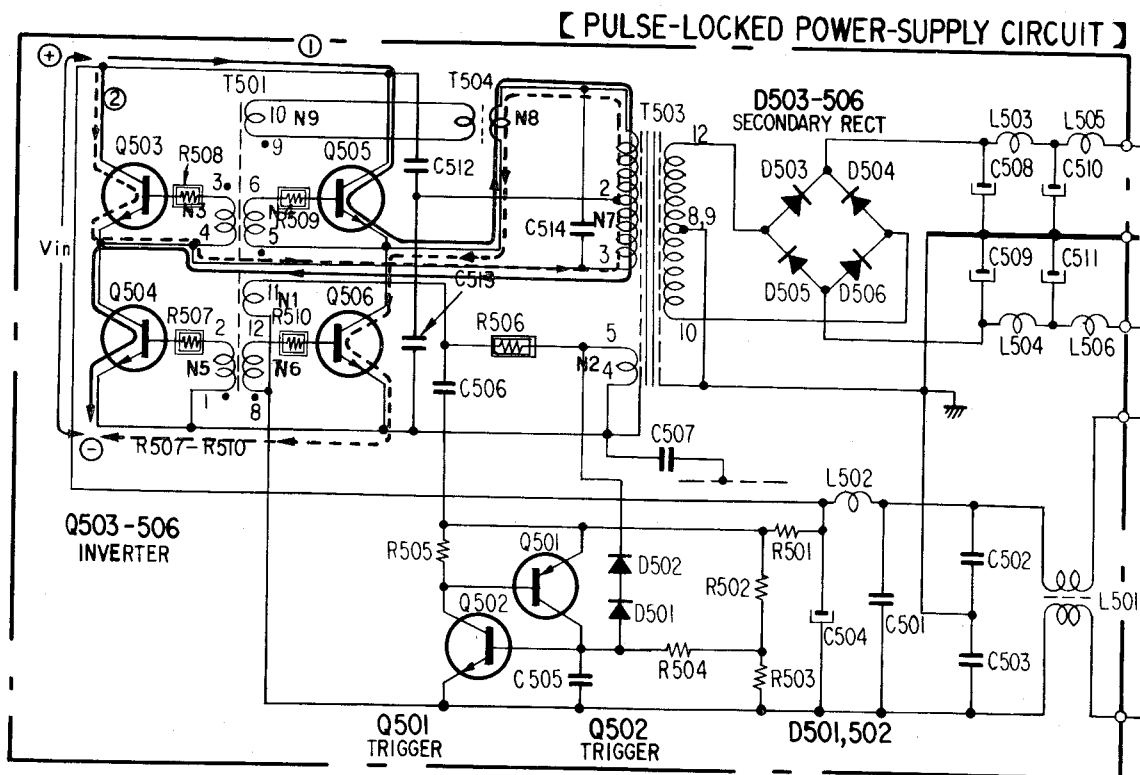


Fig. 5



N3 and N6 are wound in the same direction as N1.  
N4, N5 and N9 are wound in the opposite direction of N1.

Fig. 3

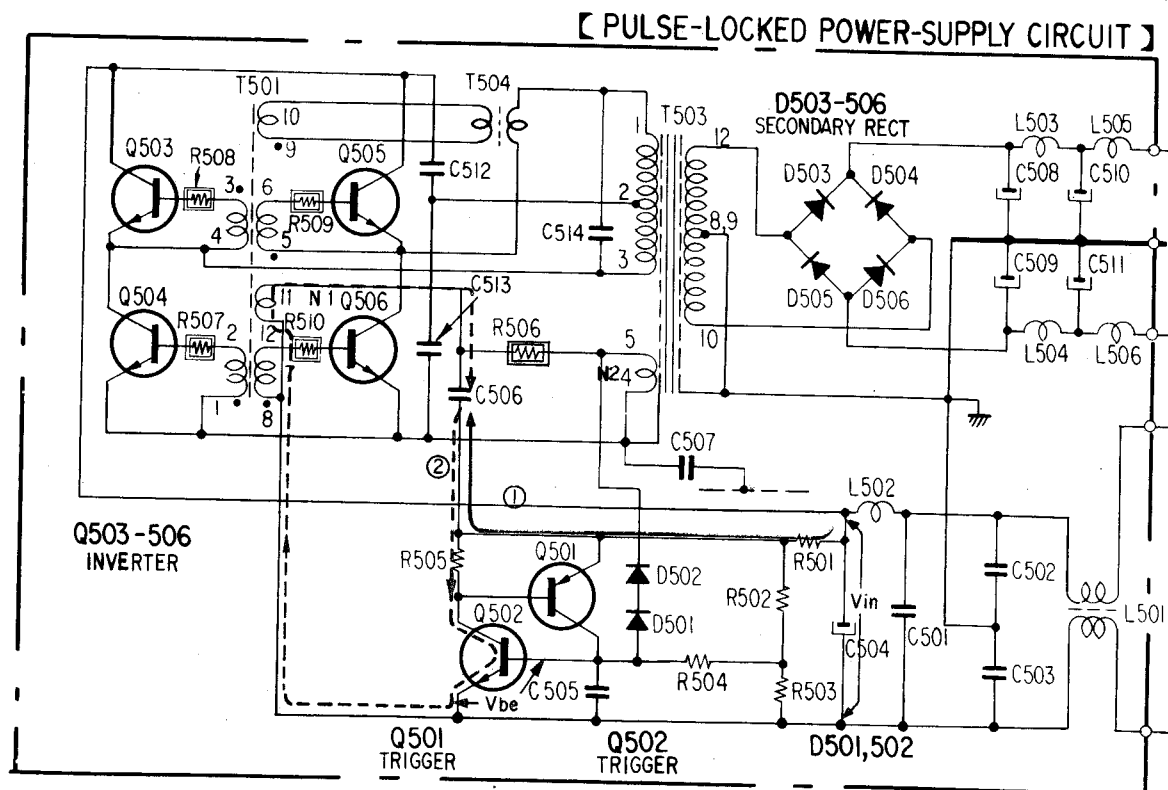
The details are as follows (See Fig. 6.);

- 1) A trigger signal is generated at winding N1 by the trigger circuit.
- 2) We assume that Q504 and Q505 are turned on by current ① which is induced by the trigger signal.
- 3) At this time, an induced current flows through winding N9 and generates voltages at windings N4 and N5. These voltages keep Q504 and Q505 on. This is a current feedback.
- 4) At the same time, an induced current flows through winding N2 of T503 and generates voltages at windings N4 and N5. These voltages also keep Q504 and Q505 on. This is a voltage feedback.
- 5) The current and voltage feedbacks keep Q504 and Q505 on and send power to T503. After a while, T501 becomes saturated and stops generating the voltages that keep Q504 and Q505 on.

- 6) Q504 and Q505 then turn off, and a voltage which is opposite in polarity to the former voltage appears at winding N2.
- 7) This voltage induces current ②, and turns Q503 and Q506 on.
- 8) After a while, Q503 and Q506 turn off and Q504 and Q505 turn on, again.
- 9) In this way, a square-wave signal is obtained at the secondary side of T503.

#### 5. SECONDARY RECTIFIER

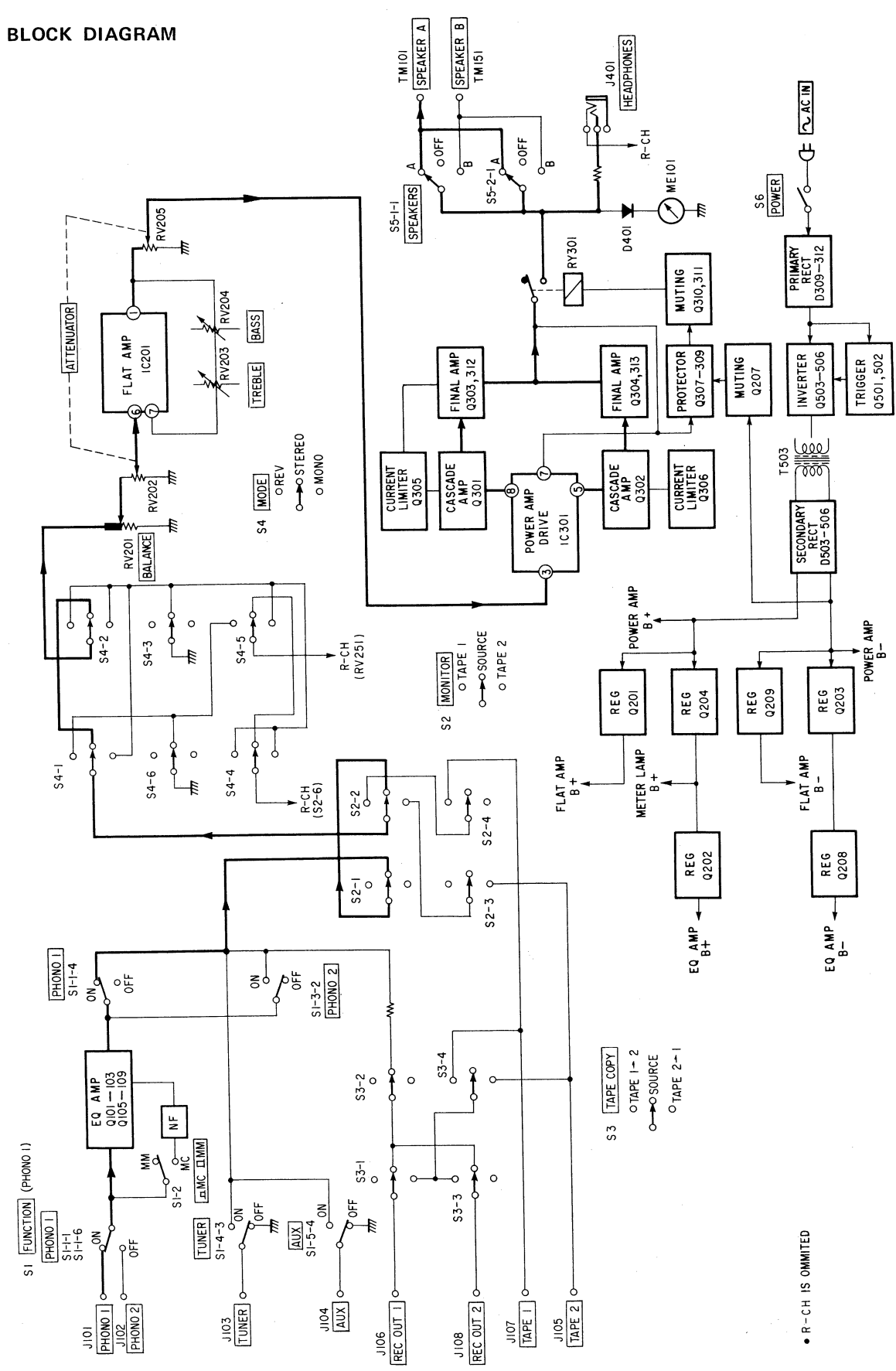
The secondary rectifier converts the square-wave into dc. This consists of D503 to D506, L503 to L506 and C508 to C511. S34-type diodes (high-speed switching diodes) are used to reduce power loss.



N3 and N6 are wound in the same direction as N1.  
N4, N5 and N9 are wound in the opposite direction of N1.

Fig. 6

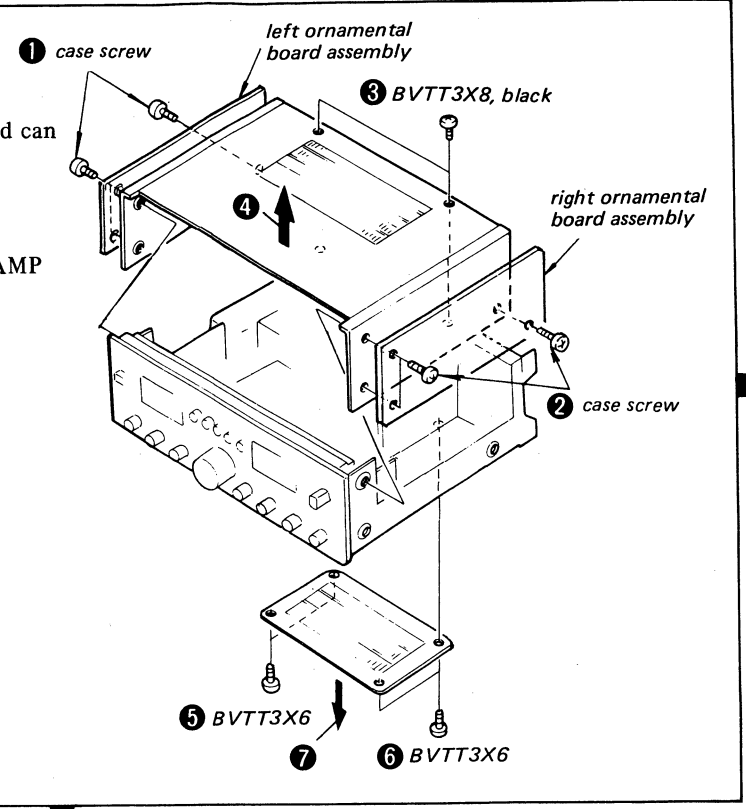
1-2. BLOCK DIAGRAM



- Follow the disassembly procedure in the numerical order given.

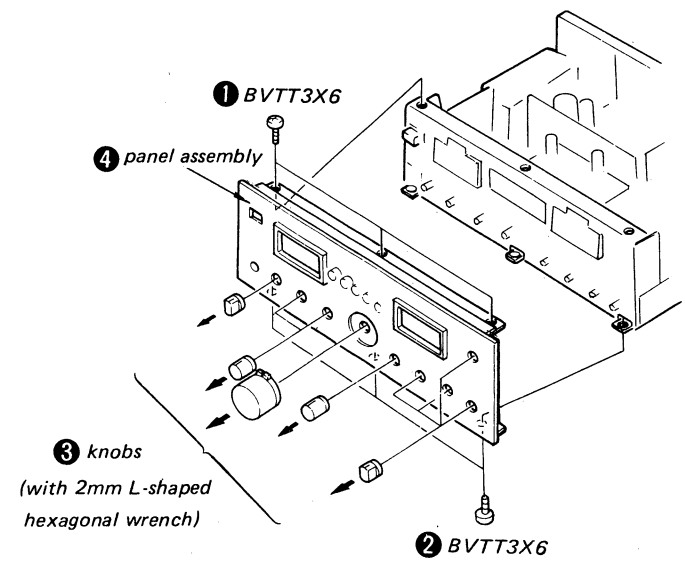
【CASE AND BOTTOM PLATE REMOVAL】

- Case: ① to ④  
The component side of the EQ AMP board can be checked.
- Bottom Plate: ⑤ to ⑦  
The conductor side of the POWER AMP board can be checked.



【PANEL ASSEMBLY REMOVAL】

After removing the panel assembly, the S6 (POWER), EQ AMP board and FLAT AMP board can be removed.



PU  
RI

p  
p

MI

Note:  
To ot  
replac  
gethe:

## SECTION 2

### DISASSEMBLY

- Follow the disassembly procedure in the numerical order given.

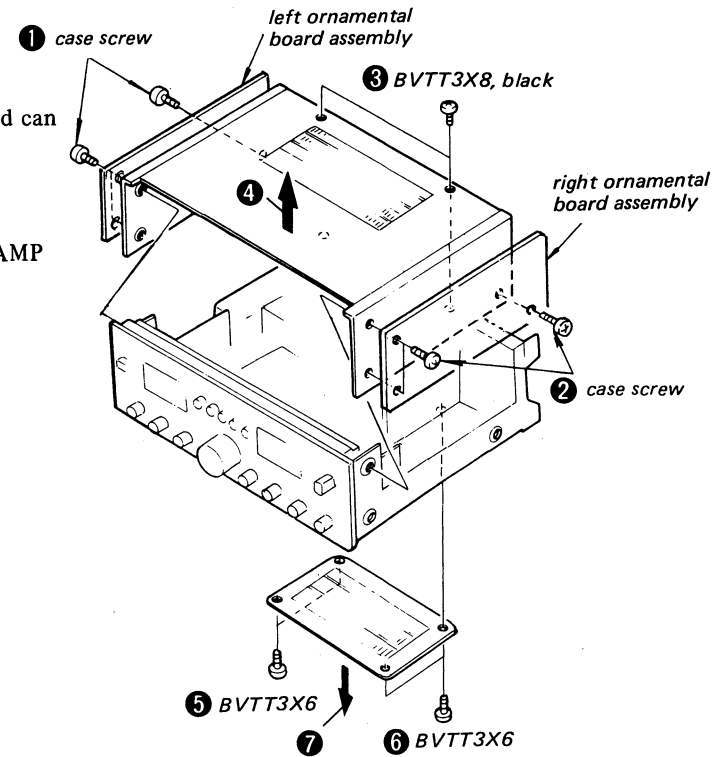
#### 【CASE AND BOTTOM PLATE REMOVAL】

Case: ① to ④

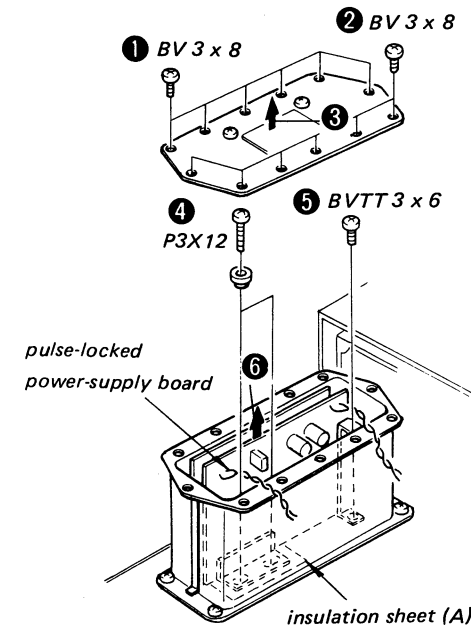
The component side of the EQ AMP board can be checked.

Bottom Plate: ⑤ to ⑦

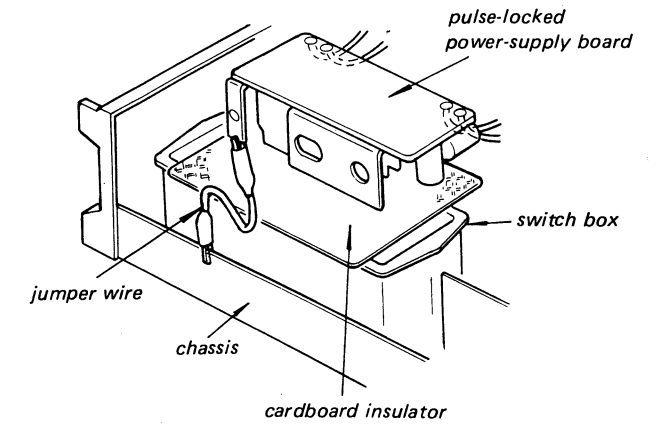
The conductor side of the POWER AMP board can be checked.



#### 【PULSE-LOCKED POWER-SUPPLY BOARD REMOVAL】

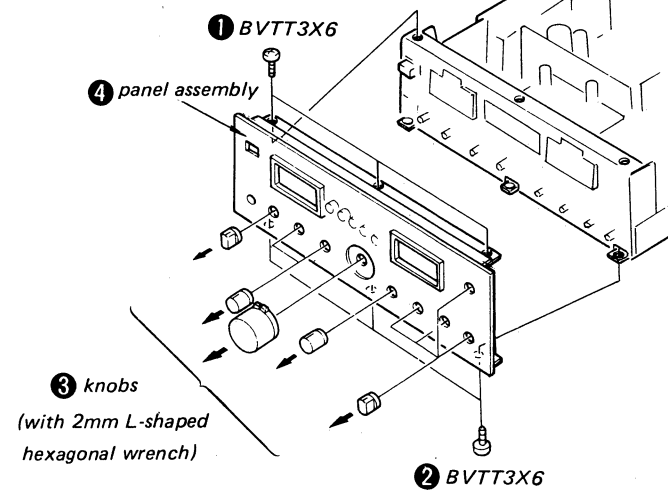


**CAUTION**  
The negative circuit of the secondary rectifier in the pulse-locked power-supply circuit is grounded by screws in the aluminum diecast box. When checking the pulse-locked power-supply board out of the box, use a jumper wire and a cardboard insulator as shown below.

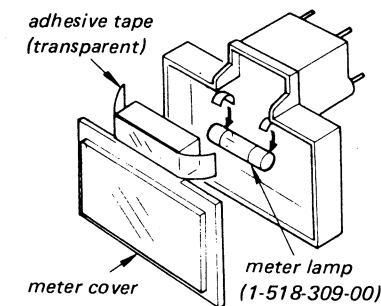


#### 【PANEL ASSEMBLY REMOVAL】

After removing the panel assembly, the S6 (POWER), EQ AMP board and FLAT AMP board can be removed.



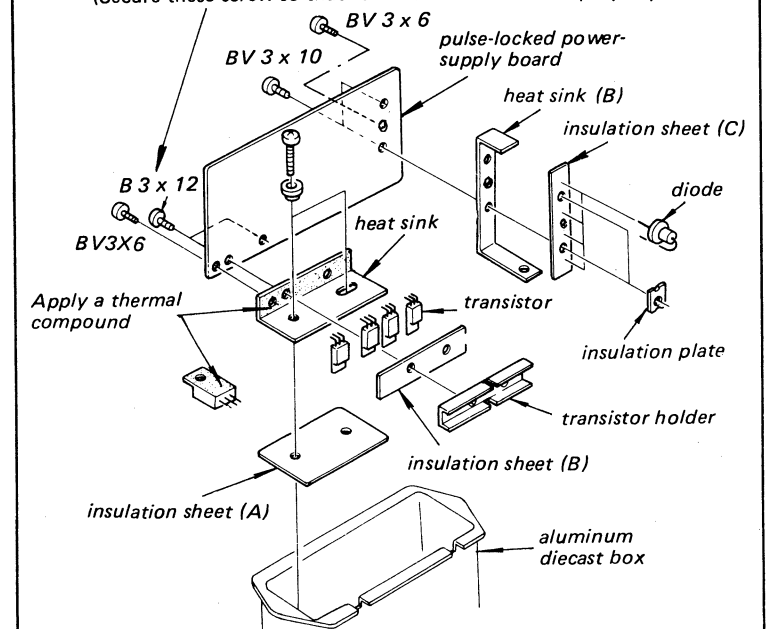
#### 【METER LAMP REPLACEMENT】



**Note:**  
To obtain the same brightness of meter lamps, replace both lamps (L-CH and R-CH) together with new ones.

Exploded view (Refer this when installing the pulse-locked power-supply board.)

(Secure these screw so that four transistors are held properly.)



**Note:**

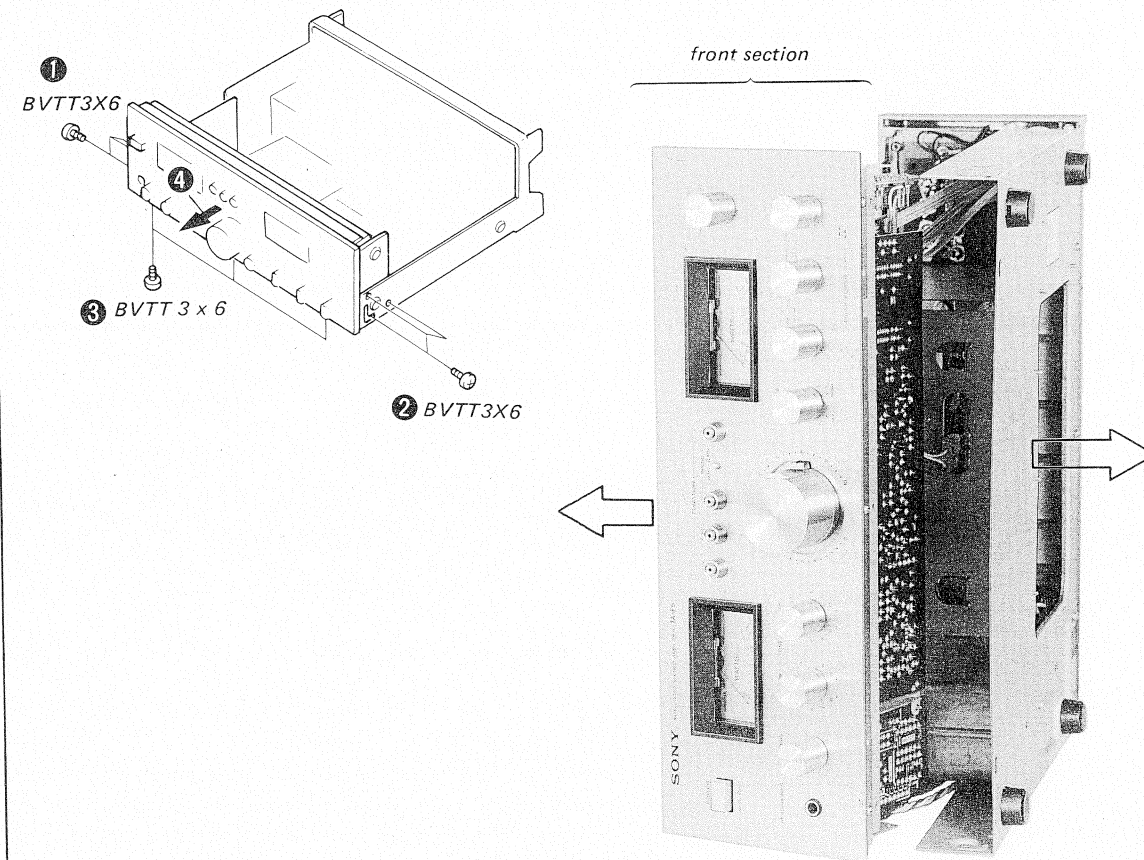
- If a insulation sheet is injured or torn, change it.
- Confirm that there are no scraps of solder or lead wire on any insulation sheet.

## SECTION 3

## ELECTRICAL ADJUSTMENTS

## 【 FLAT AMP BOARD CHECKING AND SERVICING 】

The FLAT AMP board and EQ AMP board on the front section can be separated from the chassis.



## Note:

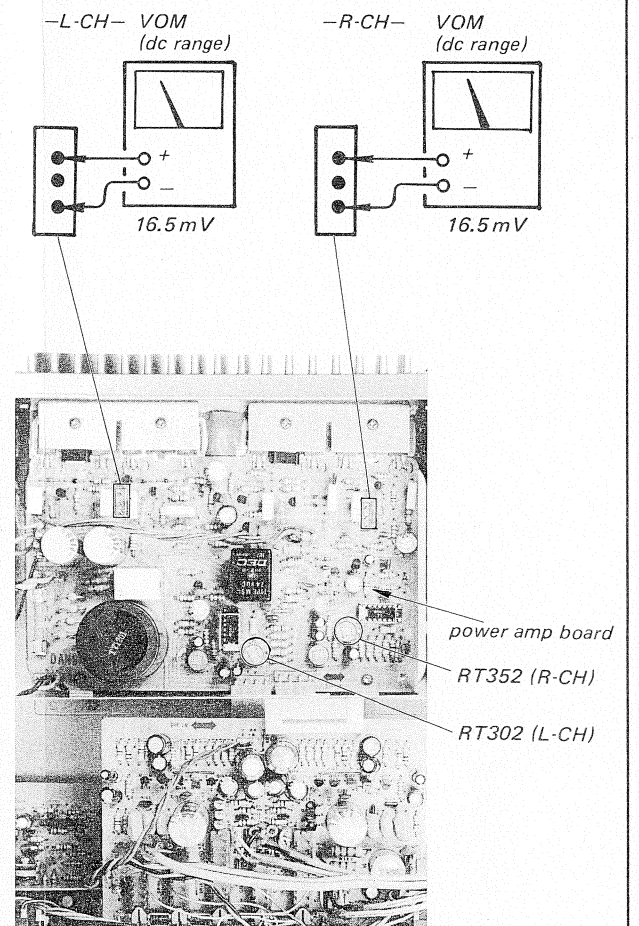
1. DC BIAS and DC BALANCE adjustments should be performed several minutes after the set becomes stable (S6: POWER is set to ON.)
2. Perform first DC BIAS adjustment.
3. Repeat DC BIAS and DC BALANCE adjustments two or three times.
4. After servicing or changing the power transistors, DC BIAS and DC BALANCE adjustments should be performed.

## DC Bias Adjustment

## Procedure:

Adjust RT302 (L-CH) and RT352 (R-CH) for 16.5 mV readings.

## Adjustment Location:





# SECTION 3

## ELECTRICAL ADJUSTMENTS

### Note:

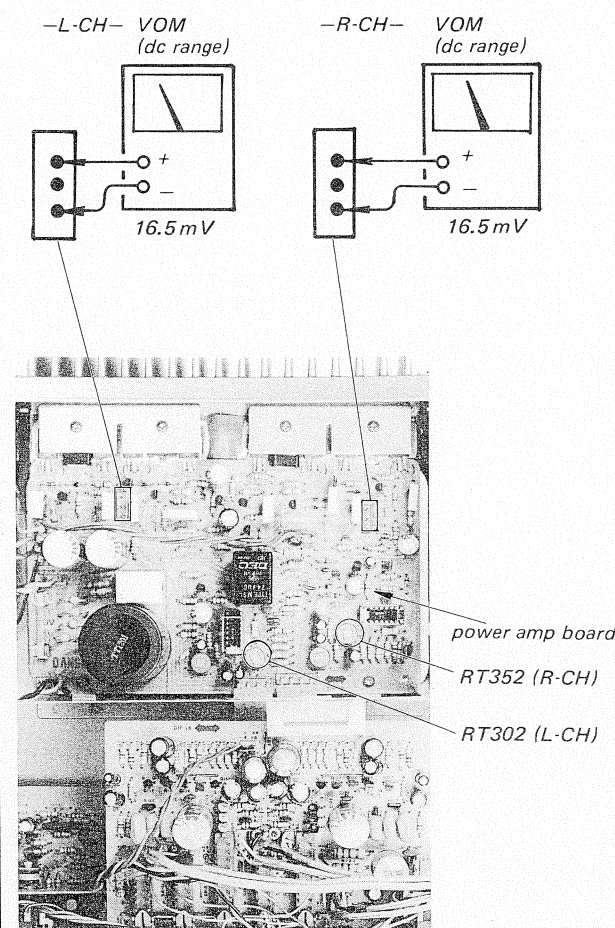
1. DC BIAS and DC BALANCE adjustments should be performed several minutes after the set becomes stable (S6: POWER is set to ON.)
2. Perform first DC BIAS adjustment.
3. Repeat DC BIAS and DC BALANCE adjustments two or three times.
4. After servicing or changing the power transistors, DC BIAS and DC BALANCE adjustments should be performed.

### DC Bias Adjustment

#### Procedure:

Adjust RT302 (L-CH) and RT352 (R-CH) for 16.5 mV readings.

#### Adjustment Location:

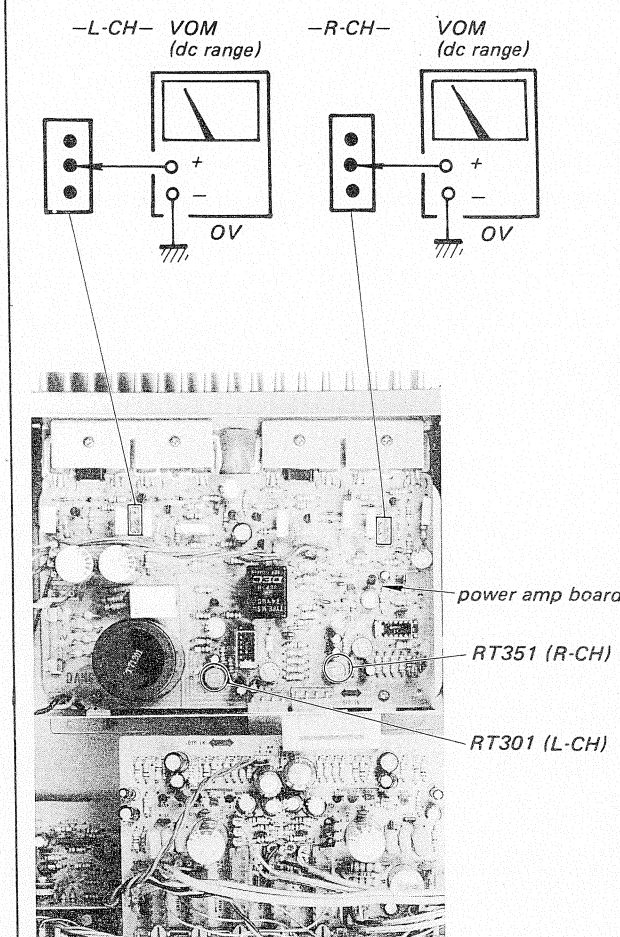


### DC Balance Adjustment

#### Procedure:

Adjust RT301 (L-CH) and RT351 (R-CH) for 0V readings.

#### Adjustment Location:

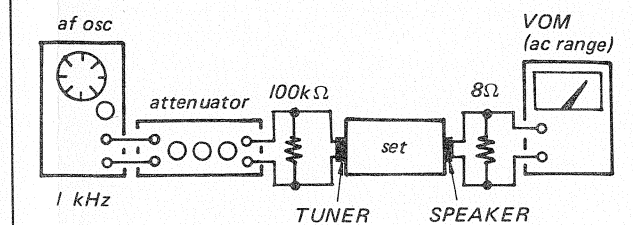


### Meter Level Calibration

#### Setting:

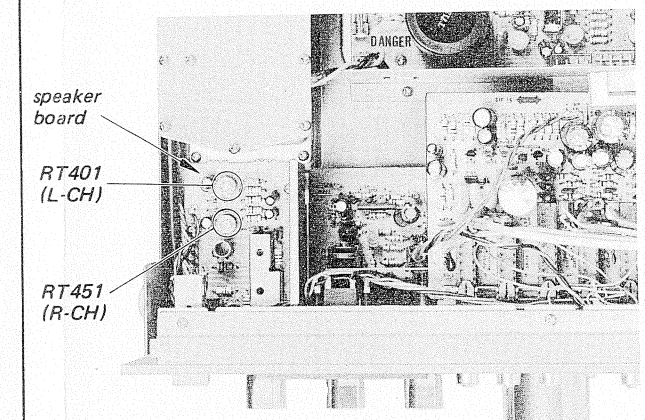
FUNCTION switch: TUNER

#### Procedure:



1. Turn the VOLUME control fully clockwise.
2. Adjust the TUNER input level for a 2.83 V reading.
3. Adjust RT401 (L-CH) and RT451 (R-CH) so that the power meters indicate 1 W.

#### Adjustment Location:





# SECTION 4 DIAGRAMS

## 4-1. MOUNTING DIAGRAM — Power Amplifier Section —

### • Replacement Semiconductors

For replacement, use semiconductors except in ( ).

Q301, 306—308  
Q310, 311, 351  
Q356, 357, 502

Q304, 354  
Q313, 363  
Q503—506: 2SC1986C-O (2SC1986D)

D303, 353  
D304, 354  
D305, 355  
D401, 451  
D402, 452  
D306, 356  
D308, 313, 363  
D501, 502

D307 : MV203V

D309—312 : UO5G (UO5E)

D309—312 : UO5G (UO5E)

D301, 302  
D351, 352

D503—506 : S34

Q501 : 2SA678

IC301, 351 : CX171

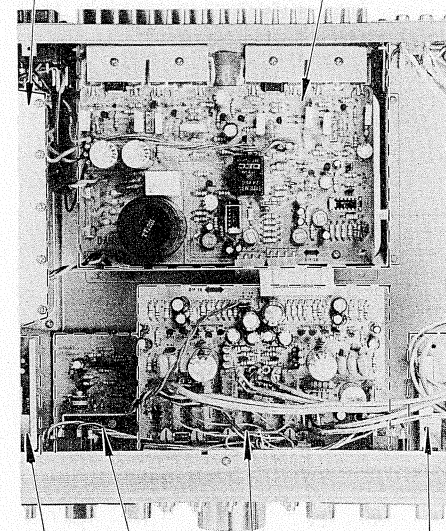
D301, 302  
D351, 352

Q302, 352  
Q305, 355  
Q309

Q303, 312  
Q353, 362

## CIRCUIT BOARD LOCATION

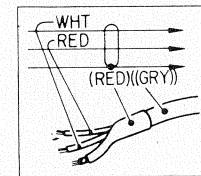
pulse-locked power-supply board power amp board



flat amp board switch board  
speaker board EQ amp board

### Note:

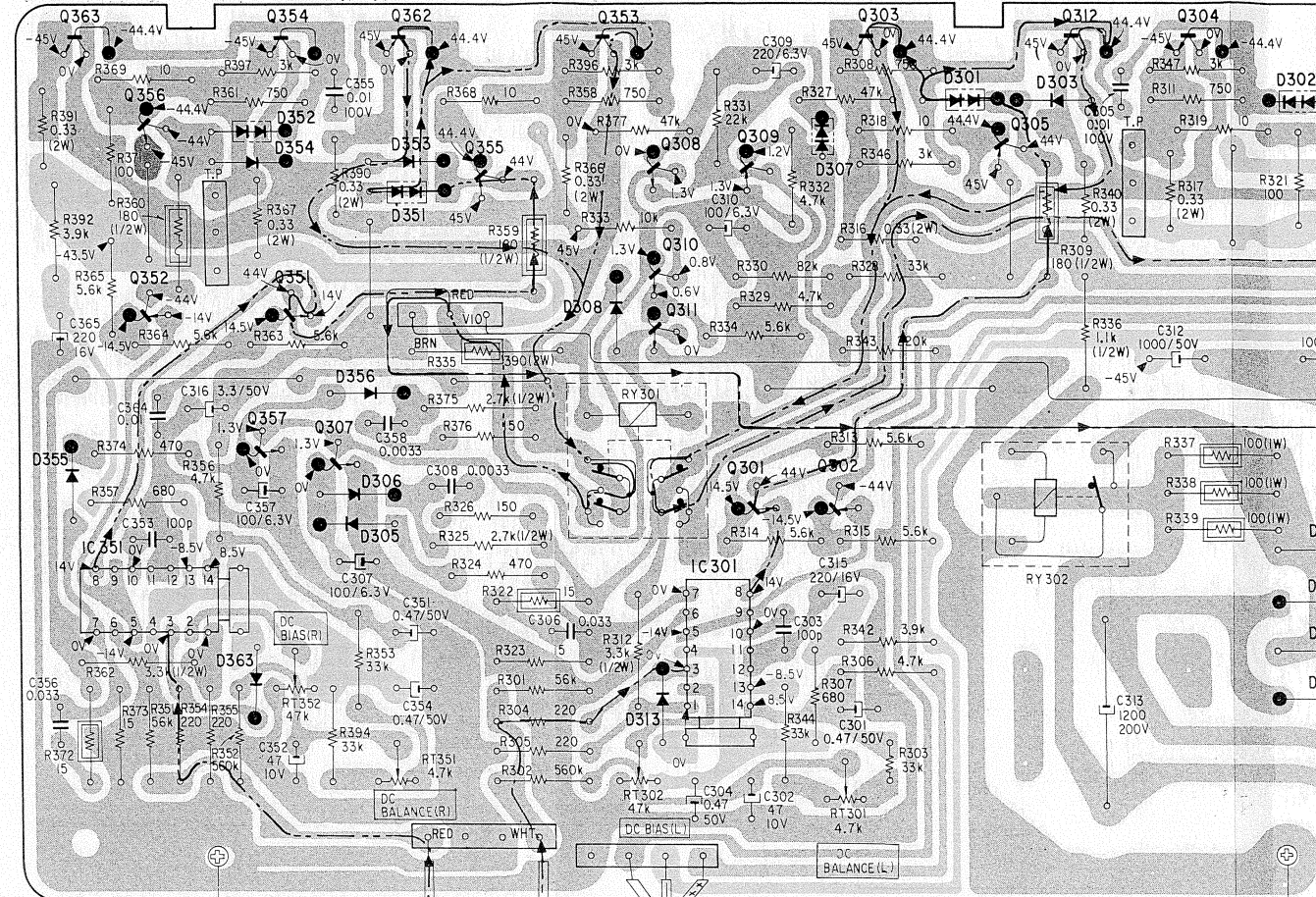
- The terminals of S7 (SPEAKERS) shown by ※ are not connected to the circuit.
- — : parts extracted from the component side.
- Color code of sleeving over the end of the jacket.



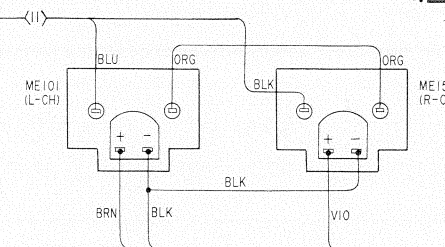
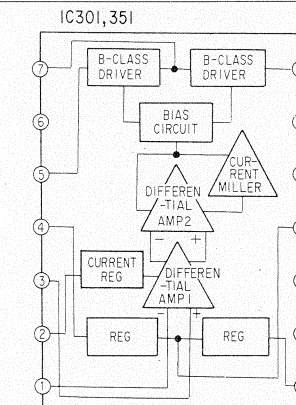
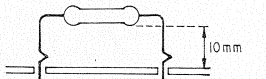
- — : B — pattern
- — : B + pattern
- Readings are taken under no-signal conditions with a VOM (20 kΩ/V).
- Signal Path  
--- : L-CH  
--- : R-CH  
— : common

|       |     |                  |                   |                   |            |     |     |                         |     |  |     |  |     |     |     |
|-------|-----|------------------|-------------------|-------------------|------------|-----|-----|-------------------------|-----|--|-----|--|-----|-----|-----|
| D     | 355 |                  | 352<br>354<br>363 | 356<br>306<br>305 | 353<br>351 |     | 308 |                         | 307 |  | 301 |  | 303 |     | 302 |
| Q, IC | 363 | 356<br>352 IC351 | 354<br>351<br>307 |                   | 362        | 355 | 353 | 308<br>310<br>311 IC301 | 309 |  | 303 |  | 305 | 312 | 304 |

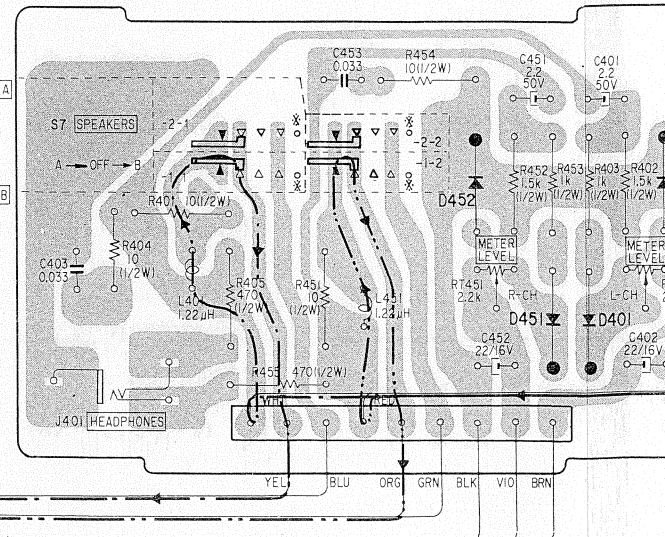
## 【 POWER AMP BOARD 】 (CONDUCTOR SIDE)



R309, 359, 310, 360, 316, 366, 317, 367, 322, 372,  
R337, 338, 339, 340, 390, 341, 391  
D309, 310, 311, 312  
are mounted as shown below.



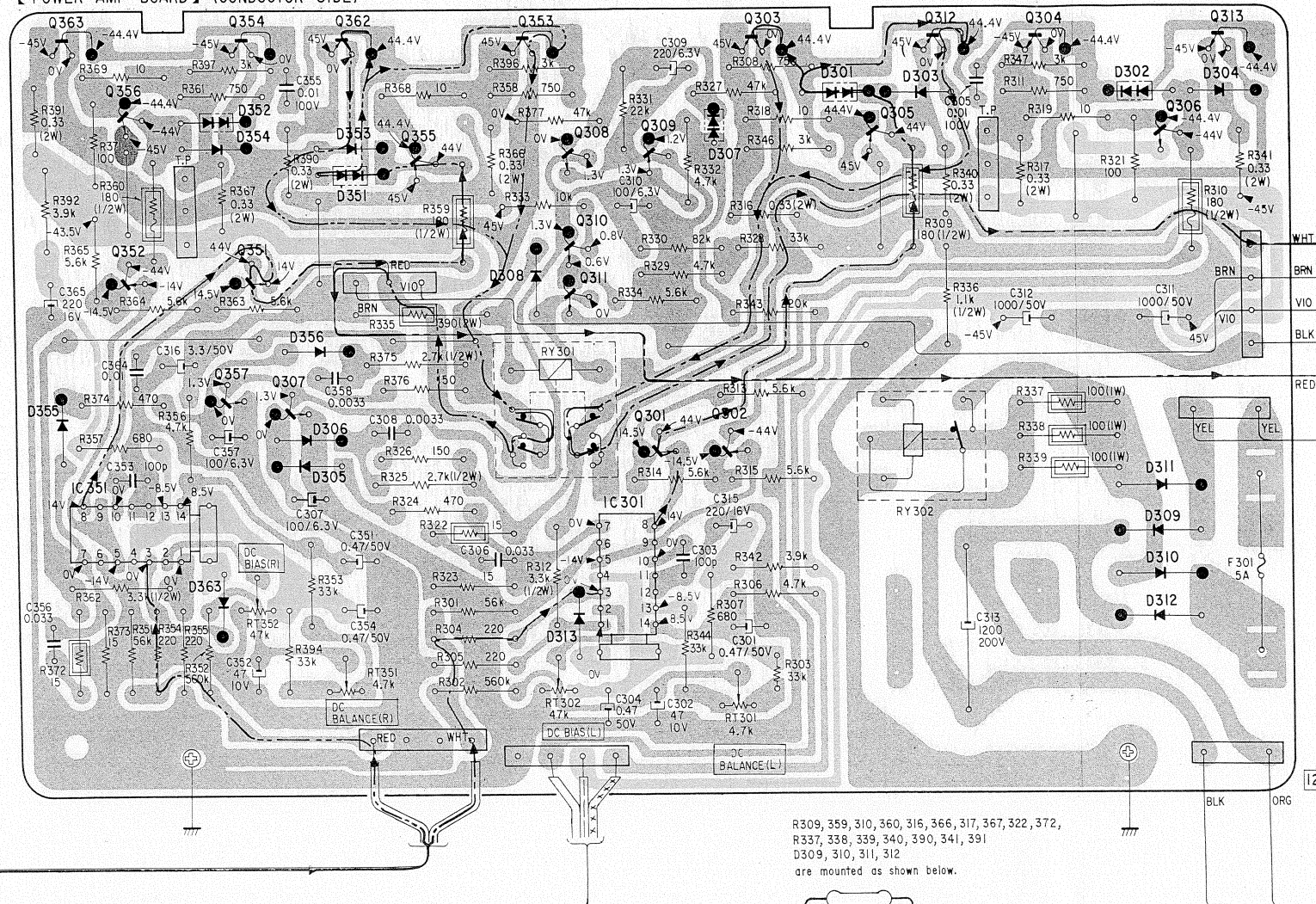
## 【 SPEAKER BOARD 】 (CONDUCTOR SIDE)



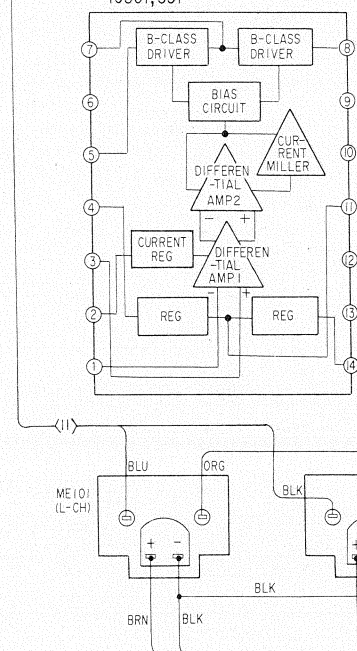


| D     | 355 | 352<br>354<br>363 | 356<br>306<br>305 | 353<br>351 | 308 | 313 | 307                     | 301        | 303        | 302<br>311<br>310<br>312 | 304 | Q, IC |
|-------|-----|-------------------|-------------------|------------|-----|-----|-------------------------|------------|------------|--------------------------|-----|-------|
| Q, IC | 363 | 356<br>352 IC351  | 354<br>357        | 351<br>307 | 362 | 355 | 353<br>310<br>311 IC301 | 309<br>301 | 303<br>302 | 305<br>312               | 304 | Q, IC |

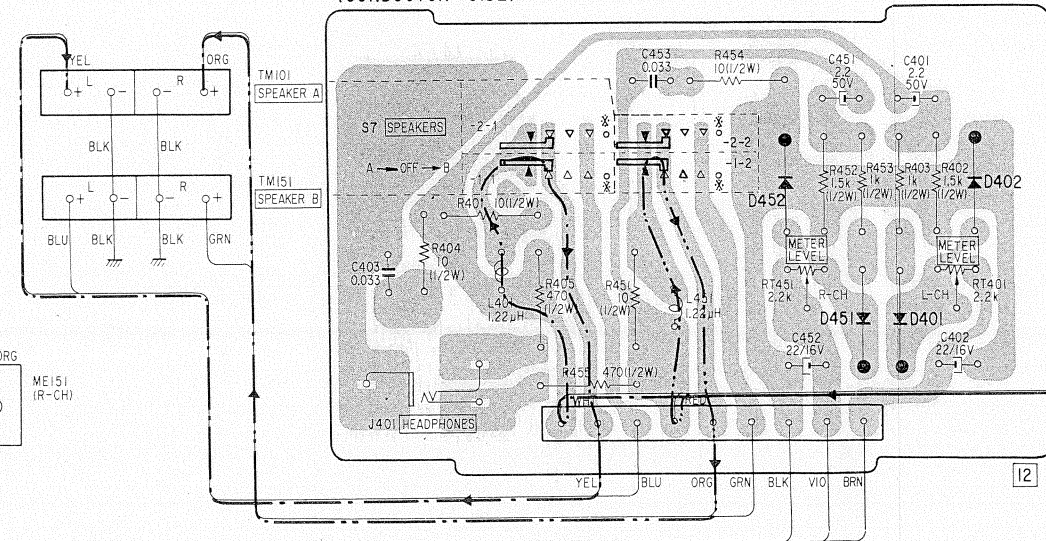
【 POWER AMP BOARD 】 (CONDUCTOR SIDE)



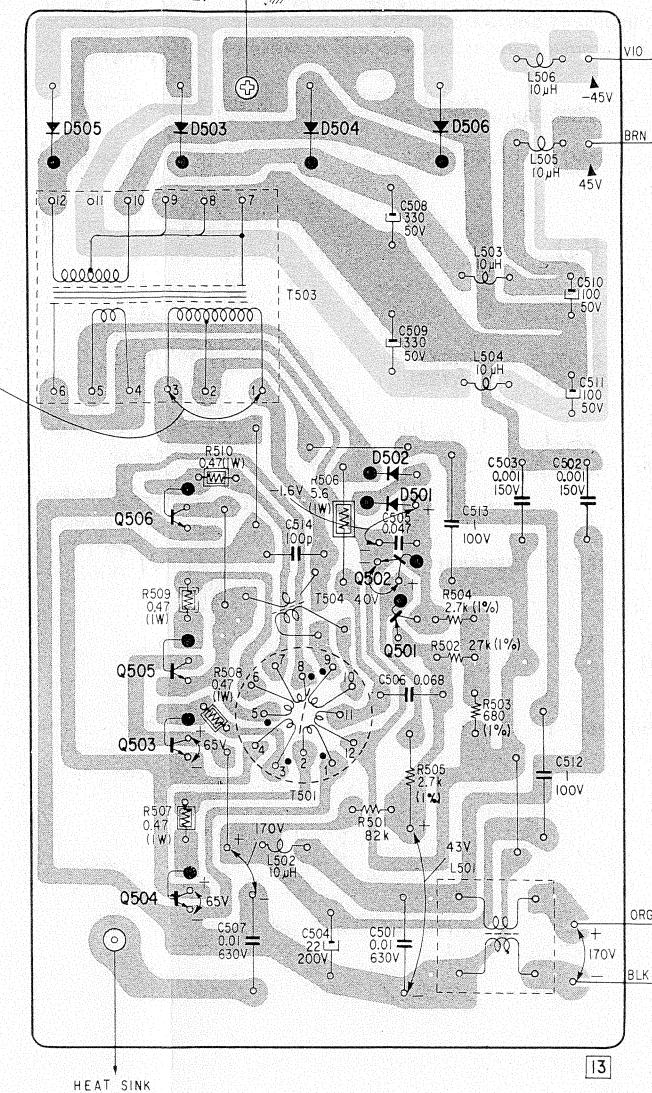
IC301, 351



【 SPEAKER BOARD 】 (CONDUCTOR SIDE)



【 PULSE-LOCKED POWER-SUPPLY BOARD 】 (CONDUCTOR SIDE)



| Q                    | D  |
|----------------------|----|
| 503, 504<br>505, 506 |    |
| 50                   | 50 |
| 506                  |    |
| 502                  |    |
| 501                  |    |
| 505                  |    |
| 503                  |    |
| 504                  |    |

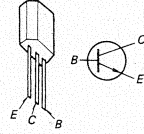


## 4.2. MOUNTING DIAGRAM — Preamplifier Section —

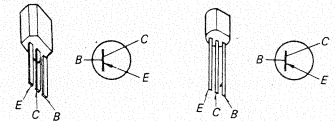
### • Replacement Semiconductors

For replacement, use semiconductors except in ( ).

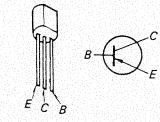
Q101-103 : 2SC1637-0 (2SC2129)  
Q151-153 : 2SC1364 (2SC1634)  
Q201, 202 :



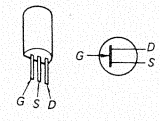
Q105, 155 : 2SA705 (2SA872)  
Q208, 209 : 2SA678 (2SA733)



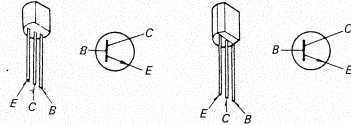
Q106, 156 : 2SA896 (2SB646)



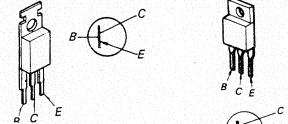
Q108, 158 : 2SK43-4 (2SK43)



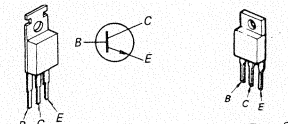
Q109, 159 : 2SC1811 (2SD666)



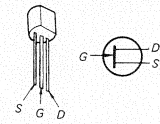
Q203 : 2SB566A (2SA768)



Q204 : 2SD476A (2SC1826)



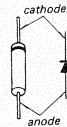
Q205-207 : 2SK30A (2SK30)



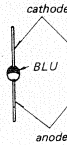
IC201, 251 : HA1457



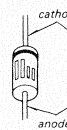
D101, 151 : 1S1555  
D205 : 10E2



D102, 152 : MV12N

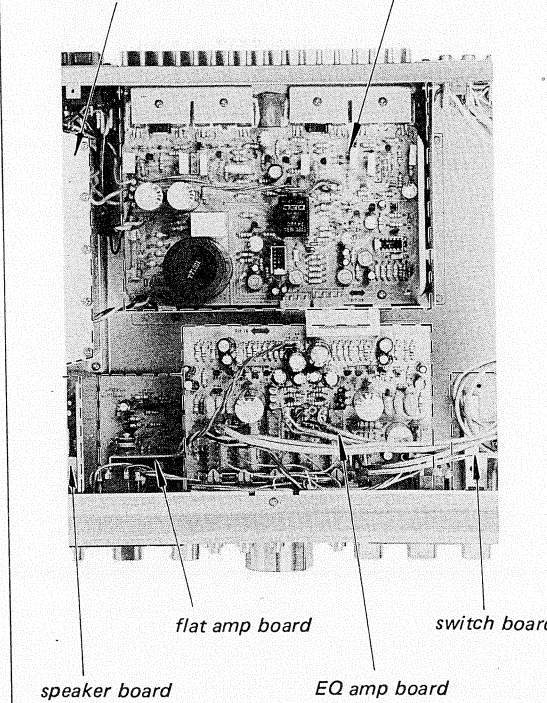


D103 : EQB01-06 (EQA01-06)  
D201, 204 : EQB01-30 (EQA01-30R)  
D202, 203 : EQB01-25 (EQA01-25R)



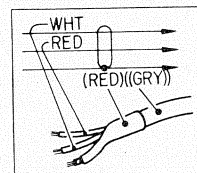
### CIRCUIT BOARD LOCATION

Pulse-clocked power-supply board power amp board



### Note:

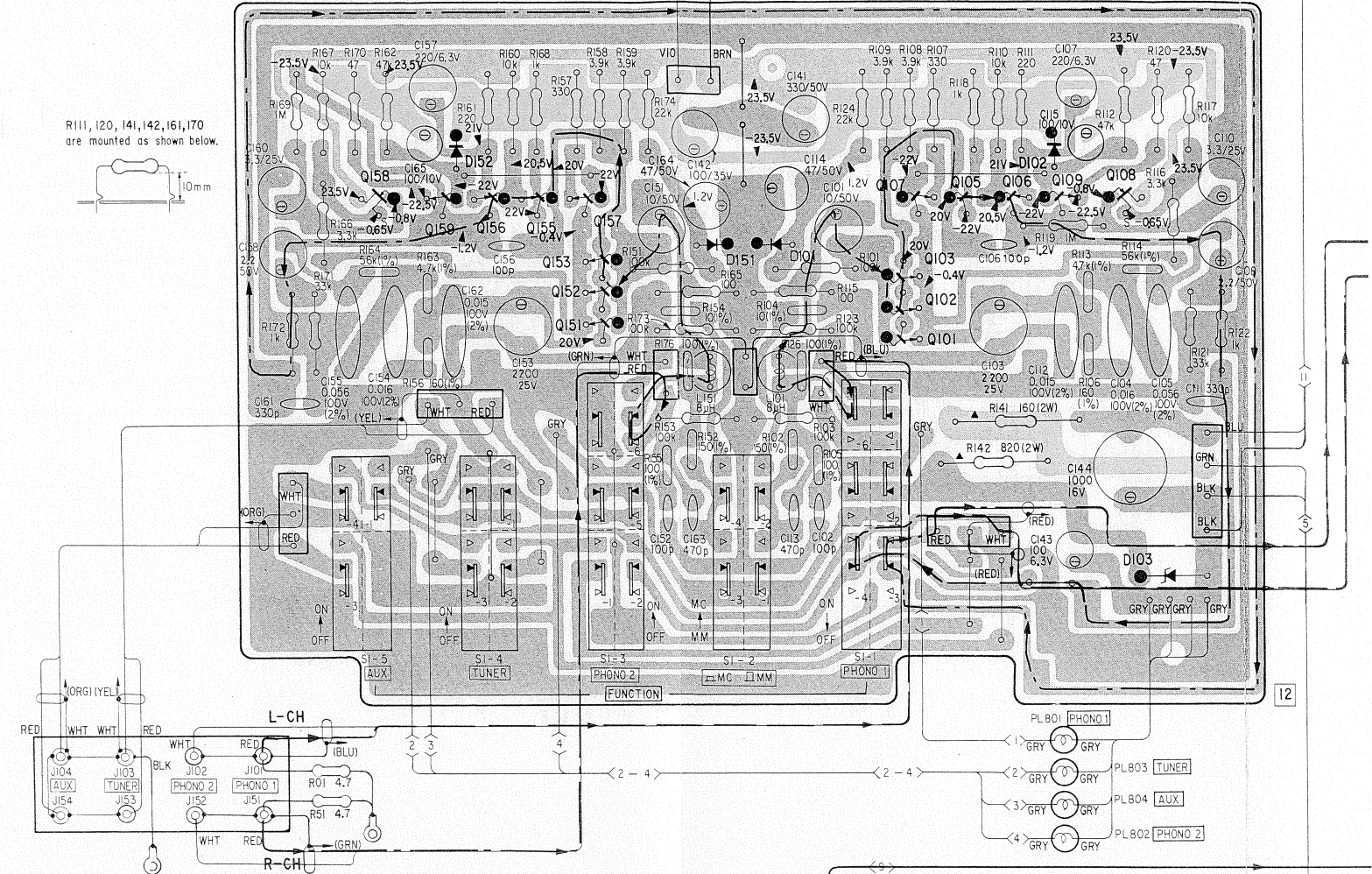
- ▲ : nonflammable resistor
- The terminals of S2 (MONITOR), S3 (TAPE COPY) and S4 (MODE) shown by ※ are not connected to the circuit.
- : parts extracted from the component side.
- Color code of sleeving over the end of the jacket.



- : B — pattern
- : B + pattern
- Signal Path
- : L-CH
- : R-CH
- : common

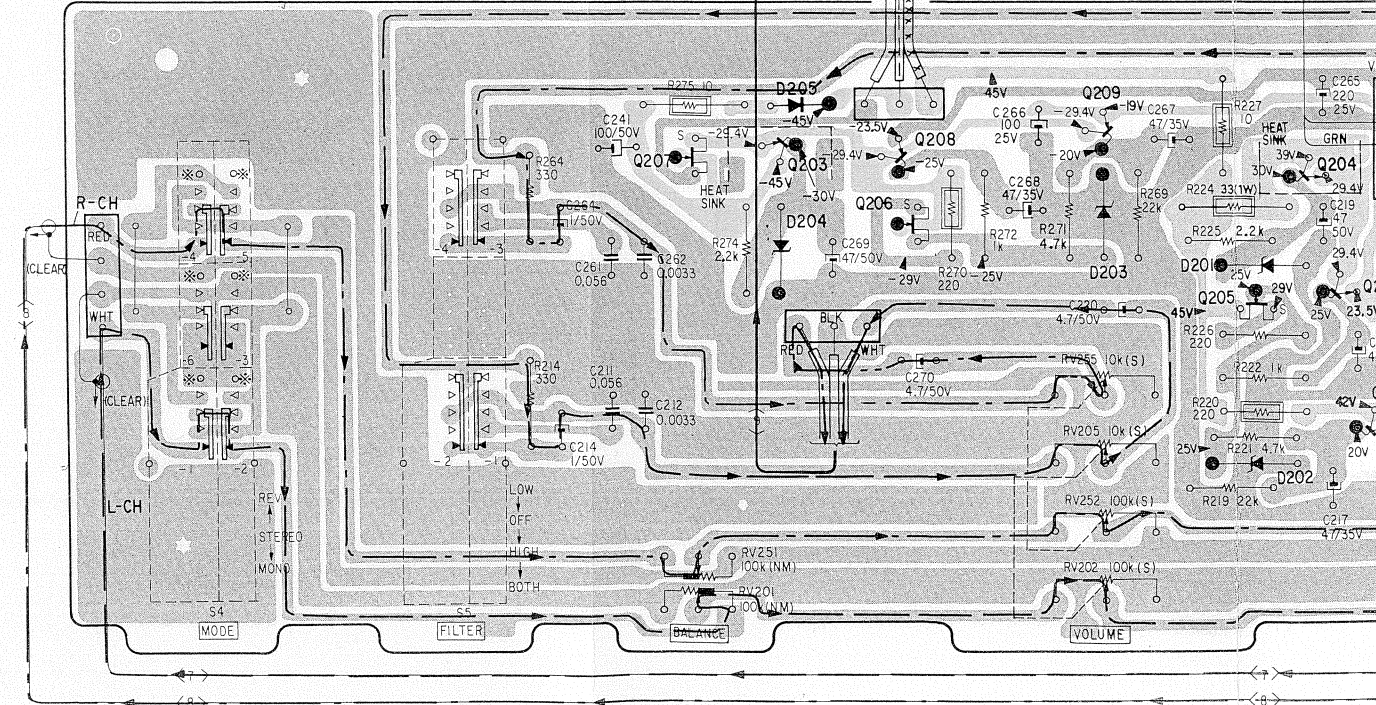
|   |     |     |     |     |     |     |          |     |     |     |     |
|---|-----|-----|-----|-----|-----|-----|----------|-----|-----|-----|-----|
| Q | 158 | 159 | 156 | 155 | 157 | 153 | 103, 107 | 105 | 106 | 109 | 108 |
| D | 152 |     |     |     |     | 151 | 101      |     |     | 102 | 103 |

### 【EQ AMP BOARD】(COMPONENT SIDE)



| Q, IC    | D     |
|----------|-------|
| 209      | 205   |
| 203      | IC251 |
| 208      |       |
| 204      |       |
|          | 203   |
| 206      | 204   |
|          | 201   |
| 205, 202 |       |
|          | 201   |
|          | 202   |
| IC201    |       |

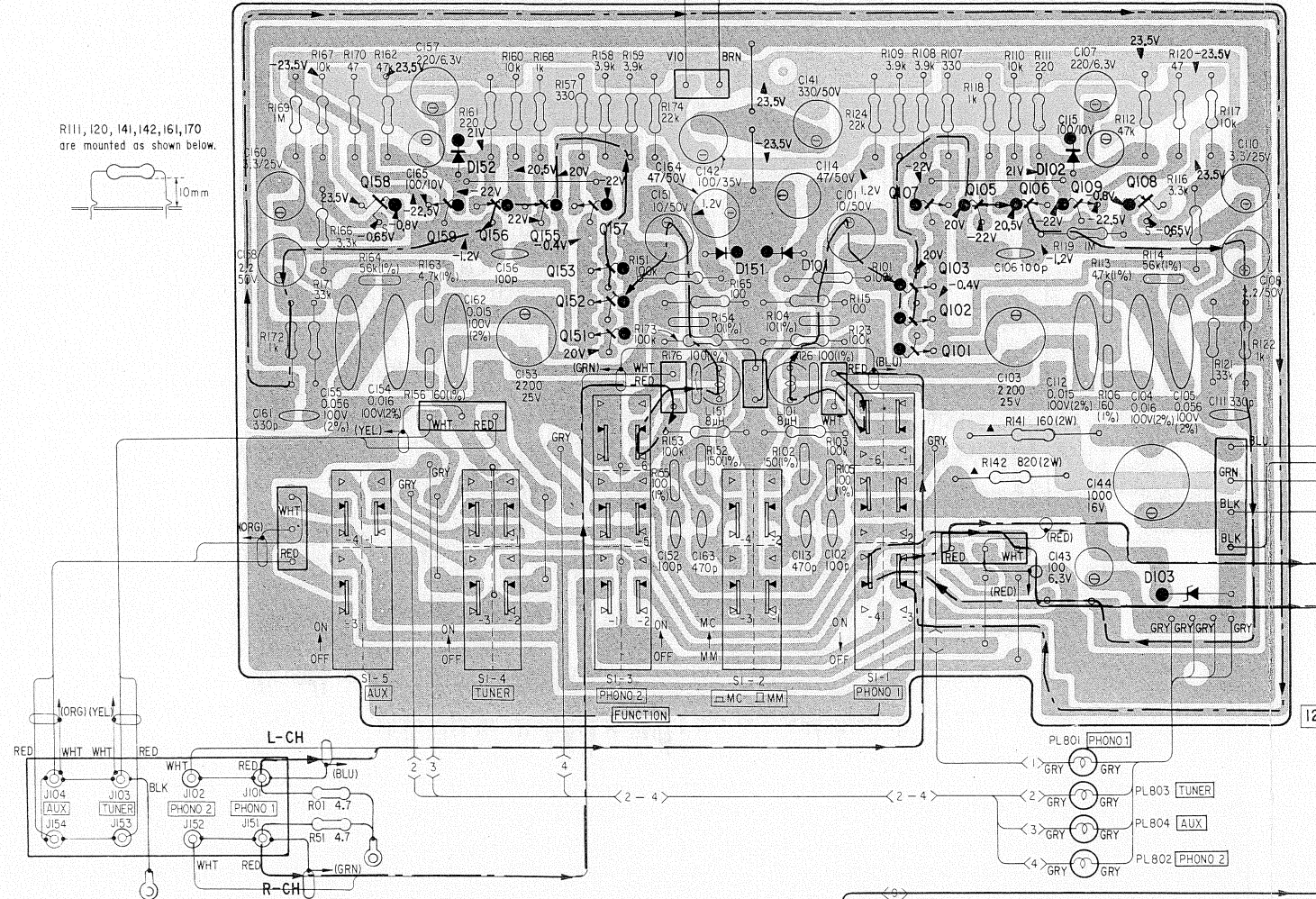
### 【FLAT AMP BOARD】(CONDUCTOR SIDE)



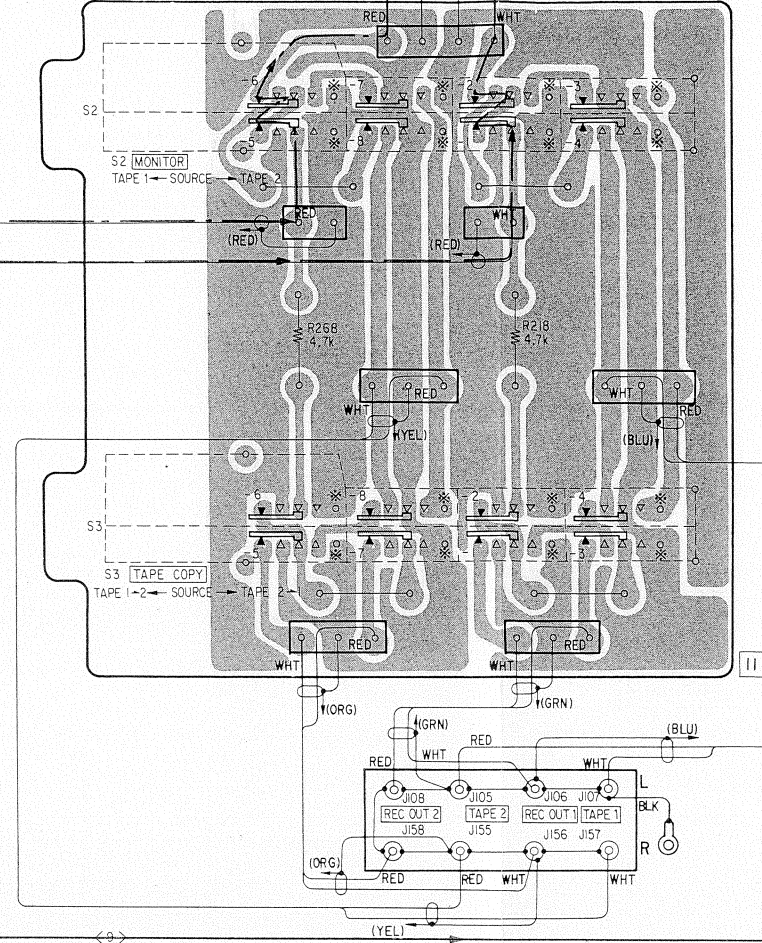


|   |     |     |     |     |     |     |         |     |     |     |     |
|---|-----|-----|-----|-----|-----|-----|---------|-----|-----|-----|-----|
| Q | 158 | 159 | 156 | 155 | 157 | 153 | 103,107 | 105 | 106 | 109 | 108 |
| D | 152 |     |     |     |     | 151 | 101     |     |     | 102 | 103 |

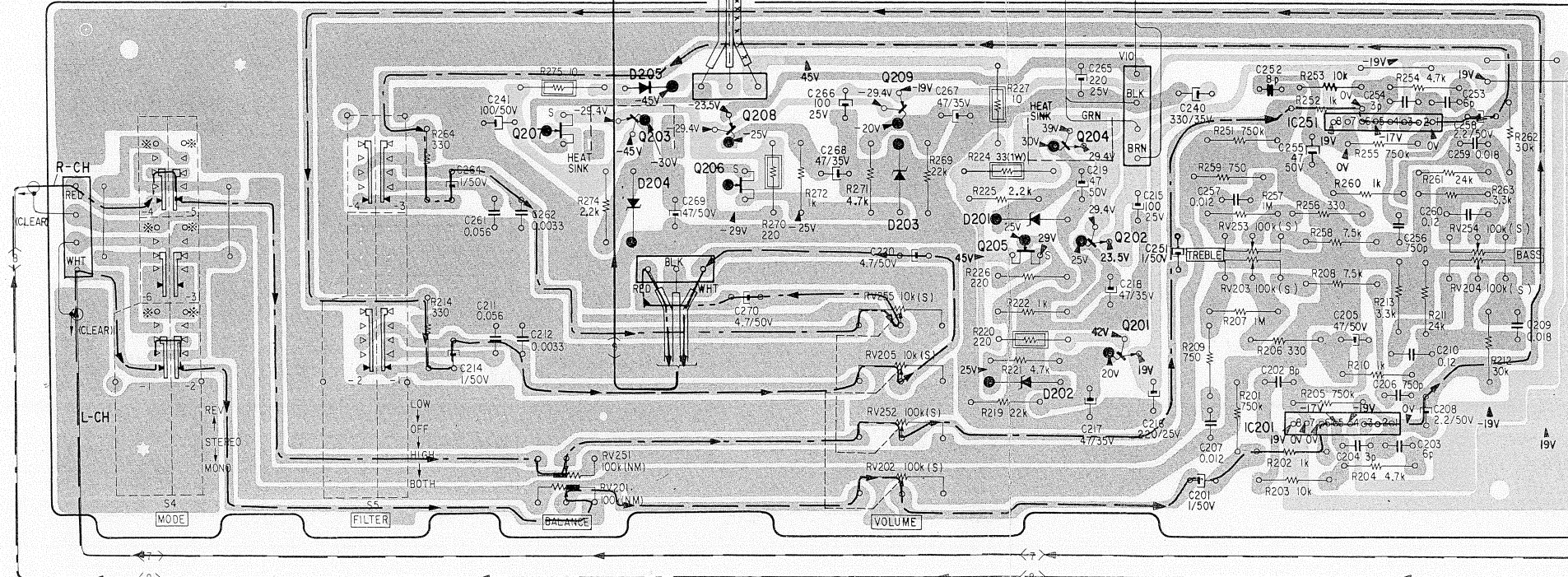
EQ AMP BOARD (COMPONENT SIDE)



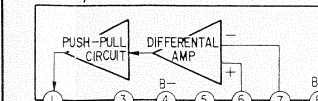
SWITCH BOARD (CONDUCTOR SIDE)



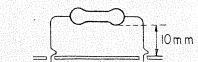
FLAT AMP BOARD (CONDUCTOR SIDE)



IC201, 251



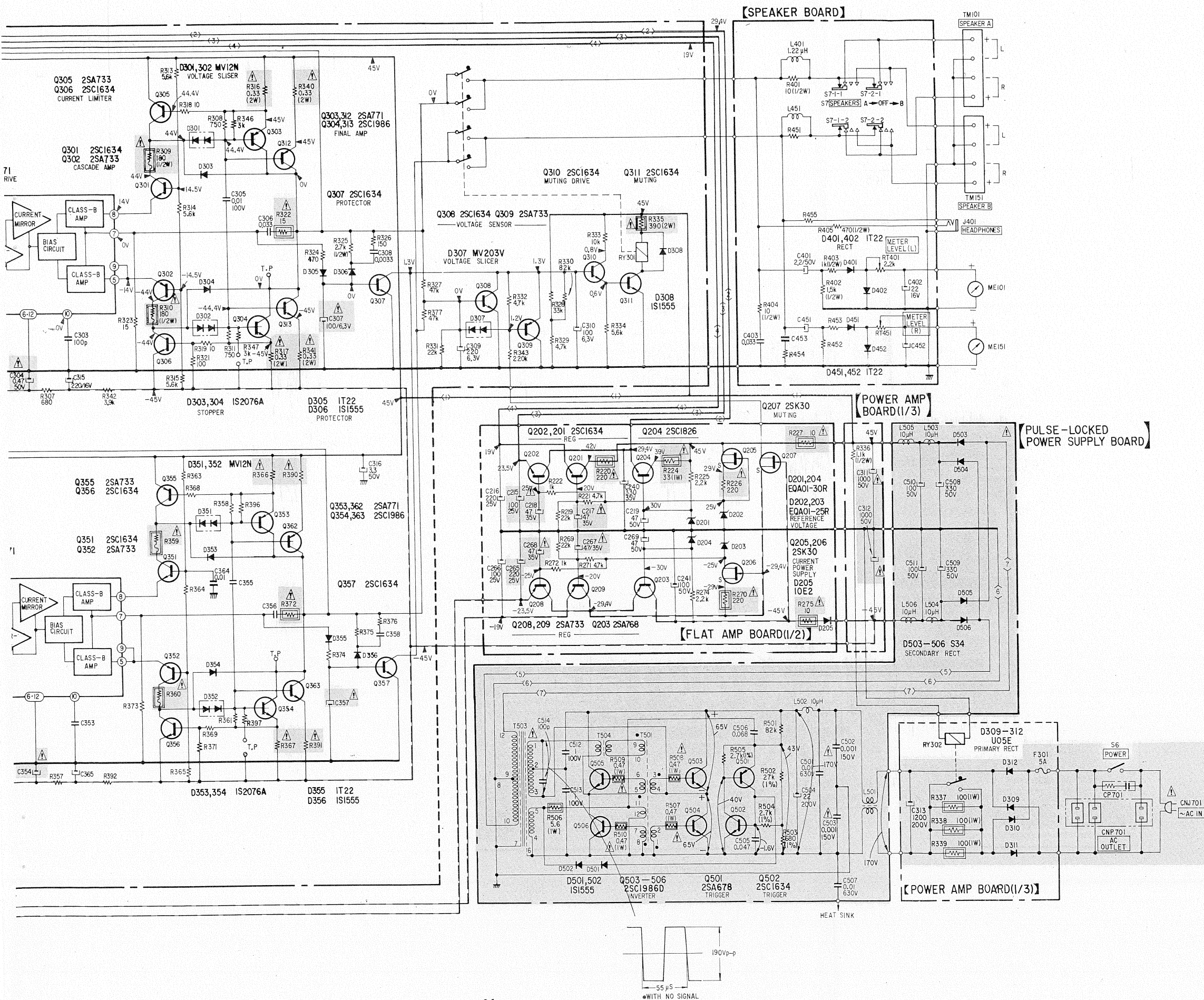
R220, 270, 224, 227, 275 are mounted as shown below.











Note:

- Components for right channel have same values as for left channel.
- 1 or 2 % indicates component tolerance.
- All capacitors are in  $\mu\text{F}$  unless otherwise noted.  $\text{pF} = \mu\mu\text{F}$   
50 WV or less are not indicated except for electrolytics.
- All resistors are in ohms,  $\frac{1}{4}$  W unless, otherwise noted  
 $\text{k}\Omega = 1000 \Omega$ ;  $\text{M}\Omega = 1000 \text{k}\Omega$
- : nonflammable resistor.
- : fusible and nonflammable resistor

- : adjustment for repair.
- : B+ bus.
- : B- bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Voltage variations may be noted due to normal production tolerances.
- Readings are taken under no-signal conditions with a VOM (20  $\text{k}\Omega/\text{V}$ ).
- Switch

| Ref. No. | Switch    | Position |
|----------|-----------|----------|
| S1-1     | PHONO 1   | ON       |
| S1-2     | MC/MM     | MM       |
| S1-3     | PHONO 2   | OFF      |
| S1-4     | TUNER     | OFF      |
| S1-5     | AUX       | OFF      |
| S2       | MONITOR   | SOURCE   |
| S3       | TAPE COPY | SOURCE   |
| S4       | MODE      | STEREO   |
| S5       | FILTER    | LOW      |
| S6       | POWER     | OFF      |
| S7       | SPEAKER   | A        |

Note: The components identified by shading and mark are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par un trame et une marque sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

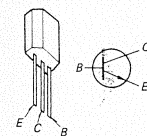


#### 4.4. MOUNTING DIAGRAM — EQ Amp Board —

##### • Replacement Semiconductors

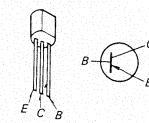
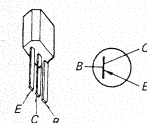
For replacement, use semiconductors except in ( ).

Q101—103: 1SC1637-0 (2SC2129)  
Q151—153: 1SC1637-0 (2SC2129)  
Q107, 157: 2SC1364 (2SC1634)

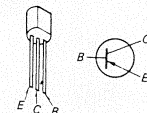


Q105, 155: 2SA705

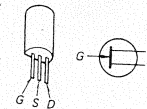
(2SA872)



Q106, 156: 2SA896 (2SB646)

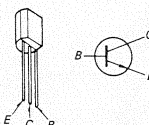
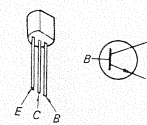


Q108, 158: 2SK43-4 (2SK43)

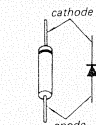


Q109, 159: 2SC1811

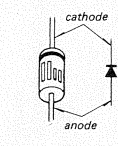
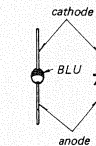
(2SD666)



D101, 151: 1S1555

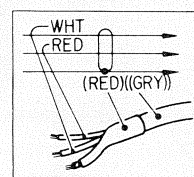


D102, 152: MV12N D103: EQB01-06 (EQA01-06)



Note:

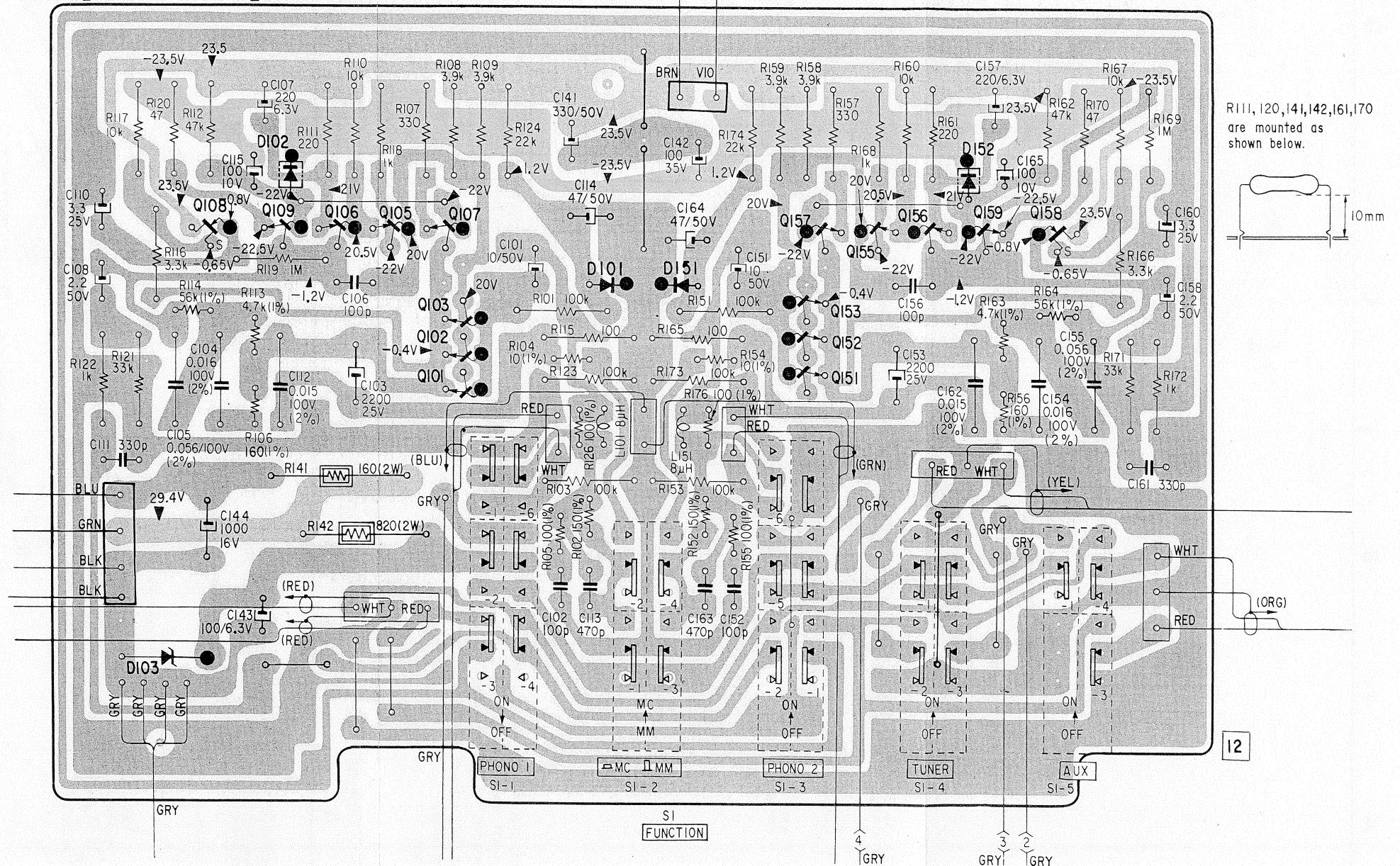
- : parts extracted from the component side.
- Color code of sleeving over the end of the jacket.



- : B — pattern
- : B + pattern

| D | 103 | 102 | 101 | 151 | 152 |
|---|-----|-----|-----|-----|-----|
| Q | 108 | 109 | 106 | 105 | 107 |
|   |     |     | 103 | 102 | 101 |
|   |     |     |     | 157 | 155 |
|   |     |     |     | 156 | 159 |
|   |     |     |     | 153 | 158 |
|   |     |     |     | 152 |     |
|   |     |     |     | 151 |     |

#### 【EQ AMP BOARD】(CONDUCTOR SIDE)



## EXPLODED VIEWS



**Note:** The components identified by shading and mark  are critical for safety. Replace only with part number specified.

- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.  
(-) = slotted head

⌊

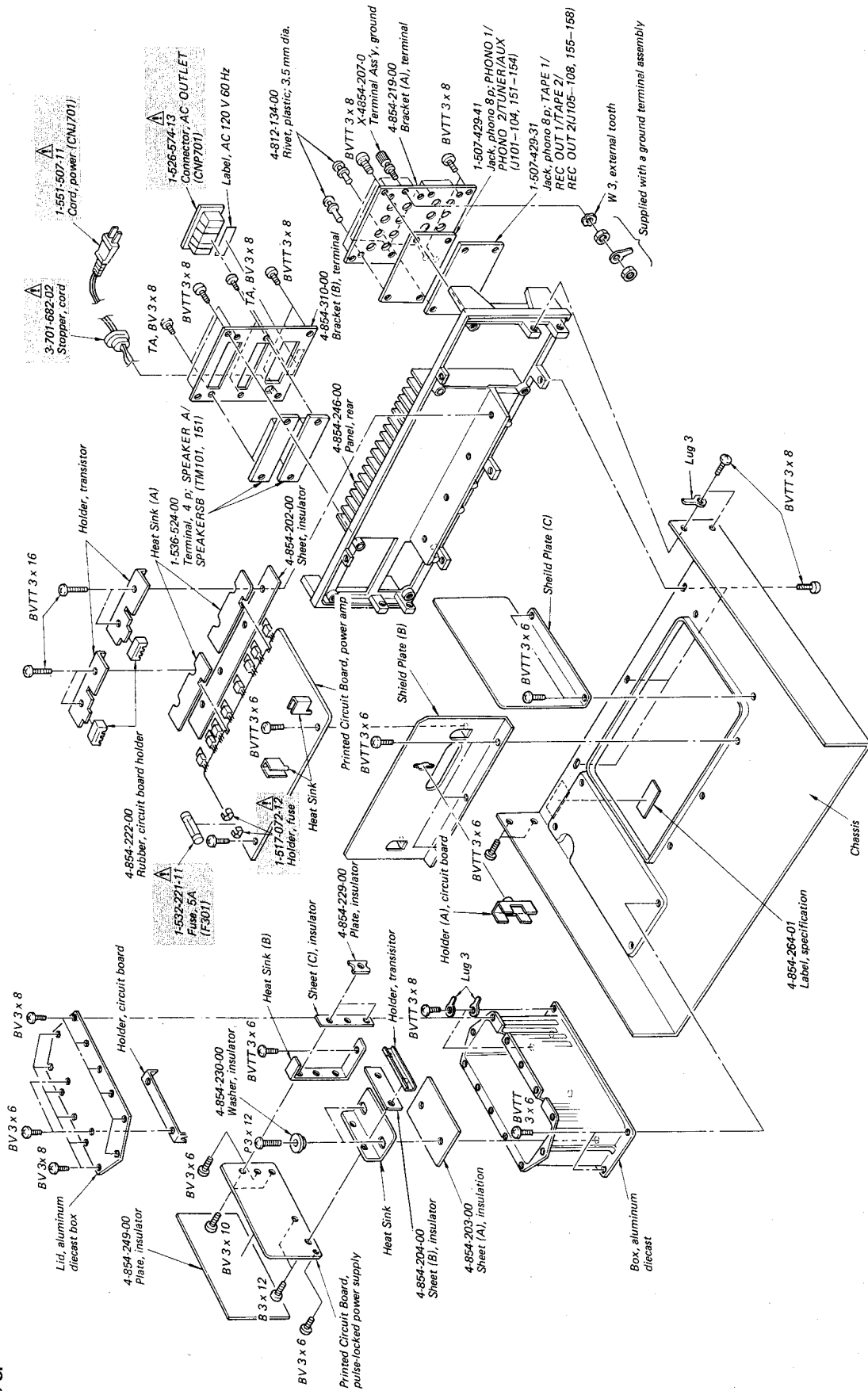
2

3

- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.

(—) = slotted head

**Note:** Les composants identifiés par un trame et une marque **A** sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.





## SECTION 6

### ELECTRICAL PARTS LIST

Ref. No.    Part No.    Description

#### SEMICONDUCTORS

##### Transistors

|                           |              |            |
|---------------------------|--------------|------------|
| ⇒ Q101-103,<br>Q151-153   | 8-761-700-00 | 2SC1637-0  |
| ⇒ Q105, 155               | 8-727-756-06 | 2SA705     |
| ⇒ Q106, 156               | 8-765-082-20 | 2SA896     |
| ⇒ Q107, 157               | 8-729-663-47 | 2SC1364    |
| ⇒ Q108, 158               | 8-723-304-00 | 2SK43-4    |
| ⇒ Q109, 159               | 8-765-012-20 | 2SC1811    |
| ⇒ Q201, 202               | 8-729-663-47 | 2SC1364    |
| ⇒ Q203                    | 8-729-306-62 | 2SB566A    |
| ⇒ Q204                    | 8-729-307-62 | 2SD476A    |
| ⇒ Q205-207                | 8-729-203-04 | 2SK30A     |
| ⇒ Q208, 209               | 8-727-788-00 | 2SA678     |
| ⇒ Q301, 351               | 8-729-663-47 | 2SC1364    |
| ⇒ Q302, 352               | 8-727-788-00 | 2SA678     |
| Q303, 353                 | 8-729-377-12 | 2SA771     |
| ⇒ Q304, 354               | 8-729-308-62 | 2SC1986C-O |
| ⇒ Q305, 355               | 8-727-788-00 | 2SA678     |
| ⇒ Q306, 356,<br>Q307, 357 | 8-729-663-47 | 2SC1364    |
| ⇒ Q308                    | 8-729-663-47 | 2SC1364    |
| ⇒ Q309                    | 8-727-788-00 | 2SA678     |
| ⇒ Q310, 311               | 8-729-663-47 | 2SC1364    |
| Q312, 362                 | 8-729-377-12 | 2SA771     |
| ⇒ Q313, 363               | 8-729-308-62 | 2SC1986C-O |
| Q501                      | 8-727-788-00 | 2SA678     |
| ⇒ Q502                    | 8-729-663-47 | 2SC1364    |
| ⇒ Q503-506                | 8-729-308-62 | 2SC1986C-O |


##### ICs

|            |              |        |
|------------|--------------|--------|
| IC201, 251 | 8-759-314-57 | HA1457 |
| IC301, 351 | 8-751-710-00 | CX171  |

##### Diodes

|           |              |          |
|-----------|--------------|----------|
| D101, 151 | 8-719-815-55 | 1S1555   |
| D102, 152 | 8-719-912-00 | MV12N    |
| ⇒ D103    | 8-719-931-06 | EQB01-06 |

⇒: Due to standardization, interchangeable replacements may be substituted for parts specified in the diagrams.

**Note: The components identified by shading and mark  are critical for safety. Replace only with part number specified.**

Ref. No.    Part No.    Description

|                           |              |          |
|---------------------------|--------------|----------|
| ⇒ D201                    | 8-719-931-30 | EQB01-30 |
| ⇒ D202, 203               | 8-719-931-25 | EQB01-25 |
| ⇒ D204                    | 8-719-931-30 | EQB01-30 |
| D205                      | 8-719-200-02 | 10E2     |
| D301, 302,<br>D351, 352   | 8-719-912-00 | MV12N    |
| D303, 304,<br>D353, 354   | 8-719-923-76 | 1S2076A  |
| ⇒ D305, 355               | 8-719-422-31 | 1T22AM   |
| D306, 356                 | 8-719-815-55 | 1S1555   |
| D307                      | 8-719-920-30 | MV203 V  |
| D308                      | 8-719-815-55 | 1S1555   |
| ⇒ D309-312                | 8-719-911-55 | U05G     |
| D313, 363                 | 8-719-815-55 | 1S1555   |
| ⇒ D401, 402,<br>D451, 452 | 8-719-422-21 | 1T22AM   |
| D501, 502                 | 8-719-815-55 | 1S1555   |
| D503-506                  | 8-719-303-41 | S34      |

#### COILS

|           |              |                          |
|-----------|--------------|--------------------------|
| L101, 151 | 1-407-519-11 | 8 $\mu$ H, microinductor |
| L401, 451 | 1-420-838-00 | 1.22 $\mu$ H             |
| L501      | 1-421-328-00 | Line Filter              |
| L502-506  | 1-421-329-00 | 10 $\mu$ H, choke        |


#### TRANSFORMERS

|      |              |           |
|------|--------------|-----------|
| T501 | 1-433-197-00 | Osc       |
| T503 | 1-466-090-00 | Convertor |
| T504 | 1-543-129-00 | Core      |







#### CAPACITORS


All capacitors are in  $\mu$ F and ceramic unless otherwise noted.  
50 WV or less are not indicated except for electrolytics.  
pF :  $\mu$ F, elect : electrolytic















|           |              |       |       |              |
|-----------|--------------|-------|-------|--------------|
| C101, 151 | 1-121-738-11 | 10    | 50 V  | elect        |
| C102, 152 | 1-102-973-11 | 100 p |       |              |
| C103, 153 | 1-123-067-11 | 2200  | 25 V  | elect        |
| C104, 154 | 1-130-125-11 | 0.016 | 100 V | polyethylene |
| C105, 155 | 1-130-126-11 | 0.056 | 100 V | polyethylene |
| C106, 156 | 1-102-973-11 | 100 p |       |              |

**Note: Les composants identifiés par un trame et une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.**




| <i>Ref. No.</i> | <i>Part No.</i>  | <i>Description</i> |       |              |  |
|-----------------|--|--------------------|-------|--------------|--|
| C107, 157       | 1-121-419-11   | 220                | 6.3 V | elect        |  |
| C108, 158       | 1-121-450-11   | 2.2                | 50 V  | elect        |  |
| C110, 160       | 1-121-392-11   | 3.3                | 25 V  | elect        |  |
| C111, 161       | 1-102-820-11   | 330 p              |       |              |  |
| C112, 162       | 1-130-124-11   | 0.015              | 100 V | polyethylene |  |
| C113, 163       | 1-102-114-11   | 470 p              |       | composition  |  |
| C114, 164       | 1-123-058-11   | 47                 | 50 V  | elect        |  |
| C115, 165       | 1-121-414-11   | 100                | 10 V  | elect        |  |
| C141            |  1-123-060-11   | 330                | 50 V  | elect        |  |
| C142            |  1-121-357-11   | 100                | 35 V  | elect        |  |
| C143            | 1-121-414-11   | 100                | 6.3 V | elect        |  |
| C144            | 1-121-944-11   | 1000               | 16 V  | elect        |  |
| C201, 251       | 1-121-391-11   | 1                  | 50 V  | elect        |  |
| C202, 252       | 1-102-945-11   | 8 p                |       |              |  |
| C203, 253       | 1-102-943-11   | 6 p                |       |              |  |
| C204, 254       | 1-102-936-11   | 3 p                |       |              |  |
| C205, 255       | 1-123-058-11   | 47                 | 50 V  | elect        |  |
| C206, 256       | 1-104-074-11   | 750 p              |       |              |  |
| C207, 257       | 1-108-372-12   | 0.012              |       | mylar        |  |
| C208, 258       | 1-121-450-11   | 2.2                | 50 V  | elect        |  |
| C209, 259       | 1-108-358-12   | 0.018              |       | mylar        |  |
| C210, 260       | 1-108-363-12   | 0.12               |       | mylar        |  |
| C211, 261       | 1-108-361-12   | 0.056              |       | mylar        |  |
| C212, 262       | 1-108-232-12   | 0.0033             |       | mylar        |  |
| C214, 264       | 1-121-391-11   | 1                  | 50 V  | elect        |  |
| C215            |  1-121-935-11 | 100                | 25 V  | elect        |  |
| C265            |  1-121-936-11 | 220                | 25 V  | elect        |  |
| C216            | 1-121-936-11   | 220                | 25 V  | elect        |  |
| C266            | 1-121-935-11   | 100                | 25 V  | elect        |  |
| C217, 267       |  1-123-186-11 | 47                 | 35 V  | elect        |  |
| C218, 268       |  |                    |       |              |  |
| C219, 269       | 1-123-058-11   | 47                 | 50 V  | elect        |  |
| C220, 270       | 1-121-750-11   | 4.7                | 50 V  | elect        |  |
| C240            | 1-123-060-11   | 330                | 35 V  | elect        |  |
| C241            | 1-123-059-11   | 100                | 50 V  | elect        |  |
| C301, 351       |  1-121-726-11 | 0.47               | 50 V  | elect        |  |
| C302, 352       | 1-121-409-11   | 47                 | 10 V  | elect        |  |
| C303, 353       | 1-102-973-11   | 100 p              |       |              |  |


Note: The components identified by shading and mark  are critical for safety. Replace only with part number specified.

















| <i>Ref. No.</i> | <i>Part No.</i>  | <i>Description</i> |       |              |  |
|-----------------|--|--------------------|-------|--------------|--|
| C304, 354       |  1-121-726-11   | 0.47               | 50 V  | elect        |  |
| C305, 355       | 1-108-377-12   | 0.01               | 100 V | mylar        |  |
| C306, 356       | 1-108-244-12   | 0.033              |       | mylar        |  |
| C307, 357       |  1-123-196-11   | 100                | 6.3 V | elect        |  |
| C308, 358       | 1-108-232-12   | 0.0033             |       | mylar        |  |
| C309            | 1-121-419-11   | 220                | 6.3 V | elect        |  |
| C310            | 1-121-414-11   | 100                | 6.3 V | elect        |  |
| C311, 312       |  1-123-061-11   | 1000               | 50 V  | elect        |  |
| C313            |  1-125-180-11   | 1200               | 200 V | elect        |  |
| C314, 364       | 1-108-239-12   | 0.01               | 50 V  | mylar        |  |
| C315, 365       | 1-123-068-11   | 220                | 16 V  | elect        |  |
| C316            | 1-121-393-11   | 3.3                | 50 V  | elect        |  |
| C401, 451       | 1-121-450-11   | 2.2                | 50 V  | elect        |  |
| C402, 452       | 1-121-479-11   | 22                 | 16 V  | elect        |  |
| C403, 453       | 1-108-244-12   | 0.033              |       | mylar        |  |
| C501            |  1-130-141-11   | 0.01               | 630 V | polyethylene |  |
| C502, 503       |  1-102-191-11  | 0.001              | 150 V |              |  |
| C504            |  1-125-176-11 | 22                 | 200 V | elect        |  |
| C505            |  1-108-246-12 | 0.047              |       | mylar        |  |
| C506            |  1-108-599-12 | 0.068              |       | mylar        |  |
| C507            |  1-130-141-11 | 0.01               | 630 V | polyethylene |  |
| C508, 509       |  1-123-060-11 | 330                | 50 V  | elect        |  |
| C510, 511       |  1-123-059-11 | 100                | 50 V  | elect        |  |
| C512, 513       |  1-130-083-11 | 1                  | 100 V | polyethylene |  |
| C514            |  1-102-973-11 | 100 p              |       |              |  |

## RESISTORS

All resistors are in ohms. Common 1/4 W carbon resistors are omitted. Refer to the list on page 31 for their resistance values. (k = 1000, M = 1000 k)


|           |   |       |     |                               |
|-----------|---|-------|-----|-------------------------------|
| R102, 152 | 1-214-112-11  | 150   |     | metal oxide                   |
| R104, 154 | 1-214-084-11  | 10    |     | metal oxide                   |
| R105, 155 | 1-214-108-11  | 100   |     | metal oxide                   |
| R106, 156 | 1-214-113-11  | 160   |     | metal oxide                   |
| R113, 163 | 1-214-148-11  | 4.7 k |     | metal oxide                   |
| R114, 164 | 1-214-174-11  | 56 k  |     | metal oxide                   |
| R126, 176 | 1-214-108-11  | 100   |     | metal oxide                   |
| R141      |  1-206-645-11 | 160   | 2 W | metal oxide<br>(nonflammable) |

Note: Les composants identifiés par un trame et une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

| Ref. No.  | Part No.   | Description                            |
|-----------|--|--|
| R142      | 1-206-662-11   | 820 2 W metal oxide<br>(nonflammable)  |
| R220, 270 |  1-211-530-11   | 220 carbon<br>(nonflammable)           |
| R224      |  1-213-125-11   | 33 1 W metal oxide<br>(nonflammable)   |
| R226      |  1-244-657-11   | 220 carbon                             |
| R227, 275 |  1-211-498-11   | 10 carbon<br>(nonflammable)            |
| R309, 359 |  1-212-988-11   | 180 ½ W fusible<br>(nonflammable)      |
| R310, 360 |  |  |
| R312, 362 | 1-244-885-11   | 3.3 k ½ W                              |
| R316, 366 |  1-217-152-11   | 0.33 2 W                               |
| R317, 367 |  |  |
| R322, 372 |  1-211-502-11   | 15 carbon<br>(nonflammable)            |
| R325, 375 | 1-244-883-11   | 2.7 k ½ W                              |
| R335      |  1-206-654-11  | 390 2 W metal oxide<br>(nonflammable)  |
| R336      | 1-244-874-11   | 1.1 k ½ W                              |
| R337-339  |  1-214-131-11 | 100 1 W metal oxide<br>(nonflammable)  |
| R340, 390 |  1-217-152-11 | 0.33 2 W                               |
| R341, 391 |  |  |
| R401, 451 | 1-244-825-11   | 10 ½ W                                 |
| R402, 452 | 1-244-877-11   | 1.5 k ½ W                              |
| R403, 453 | 1-244-873-11   | 1 k ½ W                                |
| R404, 454 | 1-244-825-11   | 10 ½ W                                 |
| R405, 455 | 1-244-865-11   | 470 ½ W                                |
| R501      |  1-244-719-11 | 82 k carbon                            |
| R502      |  1-214-166-11 | 27 k (1%) metal oxide                  |
| R503      |  1-214-128-11 | 680 (1%) metal oxide                   |
| R504, 505 |  1-214-142-11 | 2.7 k (1%) metal oxide                 |
| R506      |  1-212-369-11 | 5.6 1 W metal oxide<br>(nonflammable)  |
| R507-510  |  1-212-356-11 | 0.47 1 W metal oxide<br>(nonflammable) |


All variable and adjustable resistors have characteristic curve B, unless otherwise noted. (k : 1000)

RT301, 351 1-224-251-XX 4.7 k, adjustable; dc balance

**Note:** The components identified by shading and mark  are critical for safety. Replace only with part number specified.

| Ref. No.   | Part No.     | Description                      |
|------------|--------------|----------------------------------|
| RT302, 352 | 1-224-254-XX | 47 k, adjustable; dc bias        |
| RT401, 451 | 1-224-250-XX | 2.2 k, adjustable; meter level   |
| RV201, 251 | 1-226-215-00 | 100 k, variable; BALANCE         |
| RV202, 252 |              | 100 k/100 k/10 k/10 k, variable; |
| RV205, 255 | 1-226-127-00 | VOLUME                           |
| RV203, 253 | 1-226-211-00 | 100 k, variable; TREBLE          |
| RV204, 254 | 1-226-212-00 | 100 k, variable; BASS            |





## SWITCHES


|       |  |                                     |
|-------|--|-------------------------------------|
| S1    | 1-552-254-00   | Pushbutton, FUNCTION                |
| S2, 3 | 1-552-377-00   | Rotary-slide, MONITOR/<br>TAPE COPY |
| S4    | 1-552-375-00   | Rotary-slide, MODE                  |
| S5    | 1-552-376-00   | Rotary-slide, FILTER                |
| S6    |  1-552-018-11 | Pushbutton, POWER                   |
| S7    | 1-552-372-00   | Rotary-slide, SPEAKERS              |


## JACKS

|          |              |                               |
|----------|--------------|-------------------------------|
| J101-104 |              | Phono, 8 p; PHONO 1/PHONO 2/  |
| J151-154 | 1-507-429-41 | TUNER/AUX                     |
| J105-108 |              | Phono, 8 p; TAPE 1/REC OUT 1/ |
| J155-158 | 1-507-429-31 | TAPE 2/REC OUT 2              |
| J401     | 1-507-561-00 | HEADPHONES                    |

## MISCELLANEOUS

|            |  |  |
|------------|--|--|
| CNJ701     |  1-551-507-11 | Cord, power                                    |
| CNP701     |  1-526-574-13 | Connector, AC OUTLET                           |
| CP701      |  1-231-345-11 | Encapsulated Component                         |
| F301       |  1-532-221-11 | Fuse, 5A                                       |
| ME101, 151 | 1-520-320-00   | Meter, POWER                                   |
| PL801-804  | 1-518-115-XX   | Lamp, 6 V 35 mA; PHONO 1/<br>PHONO 2/TUNER/AUX |
| RY301      | 1-515-302-11   | Relay  |
| RY302      | 1-515-278-22   | Relay  |
| TM101, 151 | 1-536-524-00   | Terminal, 4 p; SPEAKER A/<br>SPEAKER B         |

 1-517-072-12 Holder, fuse

**Note:** Les composants identifiés par un trame et une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

## ACCESSORIES &amp; PACKING MATERIALS

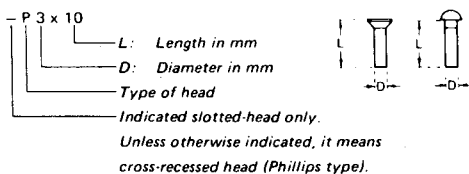
| <u>Part No.</u> | <u>Description</u>  |
|-----------------|---------------------|
| 1-506-113-11    | Plug, shorting      |
| 3-701-020-00    | Bag, plastic        |
| 3-701-622-00    | Bag, plastic        |
| 3-770-456-31    | Manual, instruction |
| 4-809-251-00    | Bag                 |
| 4-854-273-00    | Cushion             |
| 4-854-275-00    | Carton              |

## 1/4 WATT CARBON RESISTORS

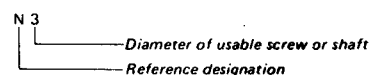
| $\Omega$ | Part No.     | $\Omega$ | Part No.     | $\Omega$ | Part No.     | $\Omega$ | Part No.     | $\Omega$ | Part No.     | $\Omega$ | Part No.     | $\Omega$ | Part No.     |
|----------|--------------|----------|--------------|----------|--------------|----------|--------------|----------|--------------|----------|--------------|----------|--------------|
| 1.0      | 1-244-601-11 | 10       | 1-244-625-11 | 100      | 1-244-649-11 | 1.0k     | 1-244-673-11 | 10k      | 1-244-697-11 | 100k     | 1-244-721-11 | 1.0M     | 1-244-745-11 |
| 1.1      | 1-244-602-11 | 11       | 1-244-626-11 | 110      | 1-244-650-11 | 1.1k     | 1-244-674-11 | 11k      | 1-244-698-11 | 110k     | 1-244-722-11 | 1.1M     | 1-244-746-11 |
| 1.2      | 1-244-603-11 | 12       | 1-244-627-11 | 120      | 1-244-651-11 | 1.2k     | 1-244-675-11 | 12k      | 1-244-699-11 | 120k     | 1-244-723-11 | 1.2M     | 1-244-747-11 |
| 1.3      | 1-244-604-11 | 13       | 1-244-628-11 | 130      | 1-244-652-11 | 1.3k     | 1-244-676-11 | 13k      | 1-244-700-11 | 130k     | 1-244-724-11 | 1.3M     | 1-244-748-11 |
| 1.5      | 1-244-605-11 | 15       | 1-244-629-11 | 150      | 1-244-653-11 | 1.5k     | 1-244-677-11 | 15k      | 1-244-701-11 | 150k     | 1-244-725-11 | 1.5M     | 1-244-749-11 |
| 1.6      | 1-244-606-11 | 16       | 1-244-630-11 | 160      | 1-244-654-11 | 1.6k     | 1-244-678-11 | 16k      | 1-244-702-11 | 160k     | 1-244-726-11 | 1.6M     | 1-244-750-11 |
| 1.8      | 1-244-607-11 | 18       | 1-244-631-11 | 180      | 1-244-655-11 | 1.8k     | 1-244-679-11 | 18k      | 1-244-703-11 | 180k     | 1-244-727-11 | 1.8M     | 1-244-751-11 |
| 2.0      | 1-244-608-11 | 20       | 1-244-632-11 | 200      | 1-244-656-11 | 2.0k     | 1-244-680-11 | 20k      | 1-244-704-11 | 200k     | 1-244-728-11 | 2.0M     | 1-244-752-11 |
| 2.2      | 1-244-609-11 | 22       | 1-244-633-11 | 220      | 1-244-657-11 | 2.2k     | 1-244-681-11 | 22k      | 1-244-705-11 | 220k     | 1-244-729-11 | 2.2M     | 1-244-753-11 |
| 2.4      | 1-244-610-11 | 24       | 1-244-634-11 | 240      | 1-244-658-11 | 2.4k     | 1-244-682-11 | 24k      | 1-244-706-11 | 240k     | 1-244-730-11 | 2.4M     | 1-244-754-11 |
| 2.7      | 1-244-611-11 | 27       | 1-244-635-11 | 270      | 1-244-659-11 | 2.7k     | 1-244-683-11 | 27k      | 1-244-707-11 | 270k     | 1-244-731-11 | 2.7M     | 1-244-755-11 |
| 3.0      | 1-244-612-11 | 30       | 1-244-636-11 | 300      | 1-244-660-11 | 3.0k     | 1-244-684-11 | 30k      | 1-244-708-11 | 300k     | 1-244-732-11 | 3.0M     | 1-244-756-11 |
| 3.3      | 1-244-613-11 | 33       | 1-244-637-11 | 330      | 1-244-661-11 | 3.3k     | 1-244-685-11 | 33k      | 1-244-709-11 | 330k     | 1-244-733-11 | 3.3M     | 1-244-757-11 |
| 3.6      | 1-244-614-11 | 36       | 1-244-638-11 | 360      | 1-244-662-11 | 3.6k     | 1-244-686-11 | 36k      | 1-244-710-11 | 360k     | 1-244-734-11 | 3.6M     | 1-244-758-11 |
| 3.9      | 1-244-615-11 | 39       | 1-244-639-11 | 390      | 1-244-663-11 | 3.9k     | 1-244-687-11 | 39k      | 1-244-711-11 | 390k     | 1-244-735-11 | 3.9M     | 1-244-759-11 |
| 4.3      | 1-244-616-11 | 43       | 1-244-640-11 | 430      | 1-244-664-11 | 4.3k     | 1-244-688-11 | 43k      | 1-244-712-11 | 430k     | 1-244-736-11 | 4.3M     | 1-244-760-11 |
| 4.7      | 1-244-617-11 | 47       | 1-244-641-11 | 470      | 1-244-665-11 | 4.7k     | 1-244-689-11 | 47k      | 1-244-713-11 | 470k     | 1-244-737-11 | 4.7M     | 1-244-761-11 |
| 5.1      | 1-244-618-11 | 51       | 1-244-642-11 | 510      | 1-244-666-11 | 5.1k     | 1-244-690-11 | 51k      | 1-244-714-11 | 510k     | 1-244-738-11 | 5.1M     | 1-244-762-11 |
| 5.6      | 1-244-619-11 | 56       | 1-244-643-11 | 560      | 1-244-667-11 | 5.6k     | 1-244-691-11 | 56k      | 1-244-715-11 | 560k     | 1-244-739-11 |          |              |
| 6.2      | 1-244-620-11 | 62       | 1-244-644-11 | 620      | 1-244-668-11 | 6.2k     | 1-244-692-11 | 62k      | 1-244-716-11 | 620k     | 1-244-740-11 |          |              |
| 6.8      | 1-244-621-11 | 68       | 1-244-645-11 | 680      | 1-244-669-11 | 6.8k     | 1-244-693-11 | 68k      | 1-244-717-11 | 680k     | 1-244-741-11 |          |              |
| 7.5      | 1-244-622-11 | 75       | 1-244-646-11 | 750      | 1-244-670-11 | 7.5k     | 1-244-694-11 | 75k      | 1-244-718-11 | 750k     | 1-244-742-11 |          |              |
| 8.2      | 1-244-623-11 | 82       | 1-244-647-11 | 820      | 1-244-671-11 | 8.2k     | 1-244-695-11 | 82k      | 1-244-719-11 | 820k     | 1-244-743-11 |          |              |
| 9.1      | 1-244-624-11 | 91       | 1-244-648-11 | 910      | 1-244-672-11 | 9.1k     | 1-244-696-11 | 91k      | 1-244-720-11 | 910k     | 1-244-744-11 |          |              |

# HARDWARE NOMENCLATURE

Screw:



Nut, Washer, Retaining ring:



| Reference Designation | Shape | Description                                 | Remarks  |
|-----------------------|-------|---|--|
| <b>SCREWS</b>         |       |   |  |
| P                     |       | pan-head screw                              | binding-head (B) screw for replacement                             |
| PWH                   |       | pan-head screw with washer face             | binding-head (B) screw and flat washer for replacement             |
| PS<br>PSP             |       | pan-head screw with spring washer           | binding-head (B) screw and spring washer for replacement           |
| PSW<br>PSPW           |       | pan-head screw with spring and flat washers | binding-head (B) screw and spring and flat washers for replacement |
| R                     |       | round-head screw                            | binding-head (B) screw for replacement                             |
| K                     |       | flat-countersunk-head screw                 |  |
| RK                    |       | oval-countersunk-head screw                 |  |
| B                     |       | binding-head screw                          |  |
| T                     |       | truss-head screw                            | binding-head (B) screw for replacement                             |
| F                     |       | flat-fillister-head screw                   |  |
| RF                    |       | fillister-head screw                        |  |
| BV                    |       | brazer-head screw                           |  |

| Reference Designation      | Shape | Description                                    | Remarks   |
|----------------------------|-------|--|---|
| <b>SELF-TAPPING SCREWS</b> |       |  |   |
| TA                         |       | self-tapping screw                             | ex: TA, P 3 x 10  |
| PTP                        |       | pan-head self-tapping screw                    | binding-head self-tapping (TA, B) screw for replacement                 |
| PTPWH                      |       | pan-head self-tapping screw with washer face   | binding-head self-tapping (TA, B) screw and flat washer for replacement |
| PTTWH                      |       | pan-head thread-rolling screw with washer face | binding-head (B) screw and flat washer for replacement                  |
| <b>SET SCREWS</b>          |       |  |   |
| SC                         |       | set screw                                      |   |
| SC                         |       | hexagon-socket set screw                       | ex: SC 2.6 x 4, hexagon socket  |
| <b>NUT</b>                 |       |  |   |
| N                          |       | nut  |   |
| <b>WASHERS</b>             |       |  |   |
| W                          |       | flat washer                                    |   |
| SW                         |       | spring washer                                  |   |
| LW                         |       | internal-tooth lock washer                     | ex: LW3, internal   |
| LW                         |       | external-tooth lock washer                     | ex: LW3, external   |
| <b>RETAINING RINGS</b>     |       |  |   |
| E                          |       | retaining ring                                 |   |
| G                          |       | grip-type retaining ring                       |   |